

THE IRON AGE

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Plant with Heavy Tools on Concrete Piling

The Mead-Morrison Mfg. Company's
Works in East Boston — Unusual
Roof Construction and Modern Details

The new works of the Mead-Morrison Mfg. Company, Boston, Mass., afford an opportunity for most instructive study by manufacturers who are planning to erect new shops or to add to existing plants, especially if their product is of a heavy character. The Mead-Morrison Company manufactures coal and ore handling machinery, and many of its installations are of the largest types. To do this

which tend toward economical and high-class production are found in the company's plant at East Boston. The equipment throughout is essentially modern.

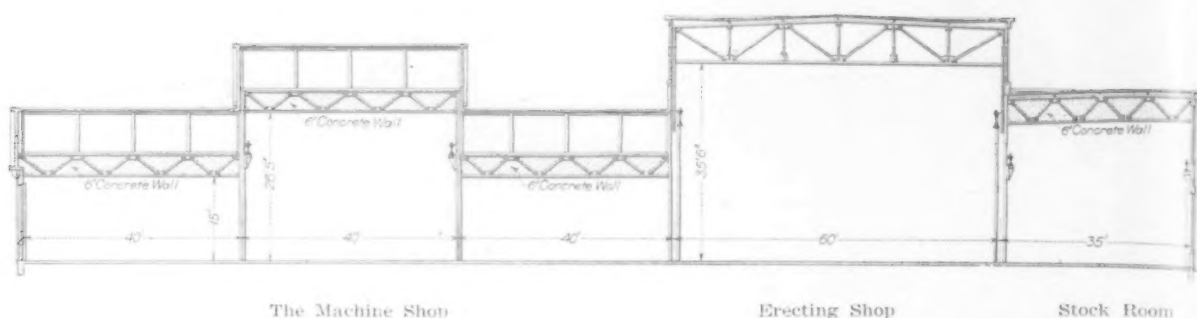
The difficulties that were overcome in preparing the site for buildings of this character are very interesting. The land lay tidewater level and was covered at each high tide. The location is highly



The Saw Tooth Roof Over a Monitor and Its Wings

work the machine shops must have a full equipment of heavy tools, as well as the usual lighter machinery. The plate and forge shops must be able to handle very heavy materials. There must be all conveniences of power, including compressed air and electricity and means of conveying the work within the departments and from one department to another. All these and other features

desirable, however, and it was considered worth while to convert the place into a good building property. A siding from the East Boston branch of the Boston & Albany Railroad was available, Boston harbor is hard by, insuring pleasant breezes in the hot weather, and no other buildings are close at hand, so that no conflagration hazard exists. The general neighborhood offers homes for work-



GENERAL CHARACTER OF THE ROOF DESIGN OF THE MEAD-MORRISON WORKS

men, which is a not unimportant factor, for in good times more than 900 men will be employed.

Consequently the land was filled in, a process which is continually going on as space for future buildings is created. Concrete and sand piles were sunk, with centers close together, and these support the floors independently of the ground beneath them, so that any settling of the earth is of no importance. The layout of all heavy machinery was carefully determined, and concrete foundations were put in for all such equipment. The underlying support is hard pan, below the point where the action of water can have any influence. The results have been most satisfactory. Steam, water and compressed air pipes and the electric cables are carried in a 30-in. pipe, extending beneath the floors from a pit in the power house through the entire length of the buildings. The laying of this pipe proved a very difficult task, because of the presence of water, but the result is one of great convenience. Manholes at intervals give free access to the pipe for repairs or changes.

The plant as it exists at the present time consists of a two-story office building, 50 x 100 ft. in plan, a building 215 x 300 ft., known as the com-

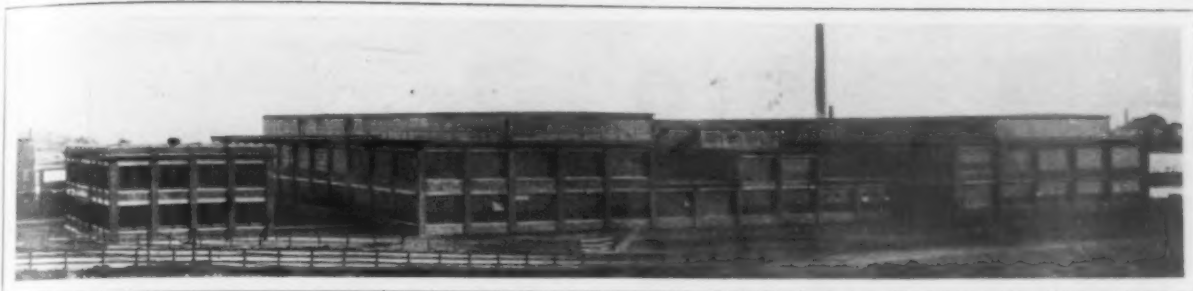
bined shop and containing the machine shops proper, the erecting floor and the stock-room; the plate and forge shops, 120 x 300 ft.; and the power house, in which is located a battery of water-tube boilers, a turbine-driven generator and a powerful air compressor, with space for future development. The company has plans for the erection of a pattern shop, 80 x 150 ft. in size, and beyond that a foundry, the details of which have not been determined. The tract of land is large enough to permit of still other additions, when the business shall require them.

The main shop building is of exceedingly interesting construction, as will be seen in the illustrations. The structure is notably well lighted, the proportion of window space being very great. The sawtooth roof is employed in a somewhat unusual manner, in that it surmounts not only the main crane bay of the machine shop, but also each of the wings. The sawteeth are of exceptionally long angles. The engineers made some careful tests and believe that they have achieved the maximum of uniform illumination by the proportions employed.

The wing of the main building next to the office



The Erecting Floor of the Mead-Morrison Plant, with Stock-Room at the Right



GENERAL SCHEME OF THE MEAD-MORRISON WORKS

is devoted to the storage of materials and parts which are ready to enter into the assembling of machinery. The smaller parts are kept in a long line of steel racks, the alcoves for brass being provided with doors, which are locked to prevent pilfering. Heavier pieces, such as gears, drums, sheaves and shafts are stored on the floor. A running inventory is maintained throughout this department. Between the stock-room and the erecting floor is a row of benches for the convenience of the workmen. In these departments the handling of heavy pieces is done by two 10-ton cranes. The remainder of this building, having a width of 120 ft., is given over to the machine shops. The crane equipment is complete throughout, and an industrial railroad connects the departments. In the center of the combined shop is the tool room where both stand and special tools are given out, and where all special jigs, fixtures and tools are made.

The great building devoted to the forge and plate departments is notable for its equipment. The arrangement of the forges with their exhaust system is shown in one of the illustrations on page 182. The balcony, which extends along one side of this structure, will be used for the template depart-

ment. The railroad siding passes through the ends of both the main building and the plate shop, and space is also provided for the passage of vehicles. All materials are delivered at this end of the shop, and thence distributed. The siding also serves the coal pocket of the boiler house.

The use of compressed air has been brought to a high degree of efficiency in the Mead-Morrison works. Every column has its valve. Rather a novelty is the doing away with tanks in connection with the compressor. Instead, the air is conveyed through 347 ft. of 4-in. galvanized iron pipe, and thence through reduced sizes to the valves. Experience has proved that this unusual length of large pipe affords ample storage. The shops have a complete equipment for the testing of the machinery which they manufacture.

The shop offices in one corner of the machine shop are partitioned off by steel walls, which are painted a dull green, and present a most attractive appearance. These rooms include the hospital which has complete equipment for the care of emergency cases. A large economy of space is secured by placing the lockers for the men on a mezzanine floor on top of the toilet room, as shown on page 182.



The Main Crane Bay of the Machine Shop, Covered by Saw Tooth Roof



The Forge Department, Mead-Morrison Works, Showing Exhaust System

War Revives Machinery Exports

The statistics of the Bureau of Foreign and Domestic Commerce, Department of Commerce, bearing on the exportation of metal-working machinery, including machine tools, sets forth in a striking manner the

growth of such exports with the progress of the European war. It is demonstrated also that prior to the war the exportation of machinery was steadily dwindling until the climax came in August, when the exports to all countries totaled but \$298,259, against \$1,375,923 in the same month of 1913. At that time, of course, shipping the world over was held up. Despite the increase in exporting, which the war developed, the figures for 11 months of 1914 are \$1,799,593 less than those for 1913 and \$903,204 less than those for 1912, as set forth in the following table:

Exports of Metal-Working Machinery for Eleven Months of 1912, 1913 and 1914.

	1912	1913	1914
France	\$1,358,799	\$1,801,234	\$1,441,536
Germany	2,871,972	2,579,508	*1,086,404
United Kingdom	2,747,882	3,218,852	4,246,174
Other Europe	3,030,353	3,441,502	3,109,710
Canada	1,632,496	1,810,352	704,381
Other countries	1,570,751	1,357,194	1,820,844
Total	\$13,212,253	\$14,208,642	\$12,409,049

*For seven months, ending with July.

No exports to Germany are shown in August, September, October and November, and the December figures are not yet available. The United Kingdom, always a good buyer of American-made machine tools and machinery, was particularly a heavy purchaser in October and November, 1914, while France more than doubled her purchases in those months in comparison with the same months in the preceding year. The larger table given herewith compares the exports of June, July, August, September, October and November, 1914, with those of the same months of 1913. The total exports to all countries in March, 1913, had a valuation of \$1,477,635 and in March, 1914, of \$1,075,896; in April, 1913, \$1,439,634, against \$1,308,821 in April, 1914, and in May, 1913, \$1,387,278, against \$1,235,590 in May, 1914.

Exports of Metal-Working Machinery, From July to December, 1913 and 1914. (Including Metal-Working Machine T.o's.)

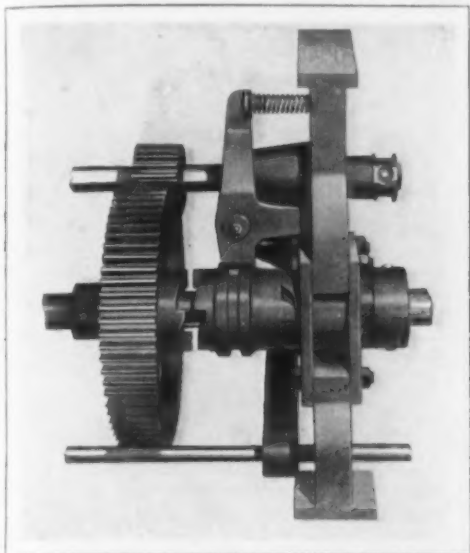
	JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER	
	1913	1914	1913	1914	1913	1914	1913	1914	1913	1914	1913	1914
France.....	\$137,696	\$106,512	\$93,296	\$52,876	\$207,963	\$9,247	\$108,642	\$40,664	\$120,089	\$251,244	\$132,648	\$355,899
Germany.....	212,197	118,514	231,122	121,756	234,459		115,590		214,611		148,050	
United Kingdom.....	323,074	309,818	312,635	264,511	348,830	183,606	255,670	312,693	322,105	899,610	115,870	1,034,432
Other Europe.....	287,224	310,671	312,875	256,486	304,706	13,753	303,052	27,920	346,855	862,704	232,492	287,946
Canada.....	199,320	66,652	157,333	50,968	178,147	41,639	104,914	54,173	103,333	23,034	69,230	26,279
Other countries.....	133,210	167,643	100,266	63,650	101,818	50,014	103,738	114,656	311,584	73,805	110,997	166,615
Total.....	\$1,292,721	\$1,079,810	\$1,207,527	\$810,247	\$1,375,923	\$298,259	\$1,081,606	\$550,106	\$1,418,577	\$2,110,397	\$809,287	\$1,871,171



A Mezzanine Floor for Lockers, Over the Toilet Room in the Mead-Morrison Works

Sheet Working Machinery Clutch

A new special type of clutch for use on sheet metal working machinery has been brought out by the Canton Foundry & Machine Company, Canton, Ohio. It is designed for use on squaring shears,



A Special Clutch That Has Been Developed for Use on Shearing Machines, Brakes, Presses and Various Other Types of Sheet Metal Working Machinery

double-end punching shears, brakes, presses and power edgers, and is being placed on the different types of sheet metal working machinery made by this company. The clutch is quick and positive in action and is claimed to add the element of safety in the operation of the machine on which it is used. It is simple in construction and designed for long wear, not having parts that are likely to give out.

At the side of the clutch block or sliding clutch member, which is on a sliding shaft, there is a lug which engages with a notcher on the boss or clutch bearing on the side frame, when the clutch is thrown out. The clutch is thrown in by pressing down on a foot treadle, which is held down until the lug is disengaged from the notcher and a quarter revolution made and the sliding clutch member becomes engaged with that on the gear wheel by four teeth on the clutch members. As the sliding clutch member rotates, the lug rides around on the face of the boss until it has made a complete revolution. Then actuated by a spring, acting on a bell crank lever which is connected to a yoke in the moving clutch member, the moving clutch is automatically thrown out of engagement with the member on the gear wheel, the lug being reseated in the notcher, bringing the shaft to a stop. All parts of the clutch are cast iron, except the yoke, which is a forging.

Life-Saving in Steel Works

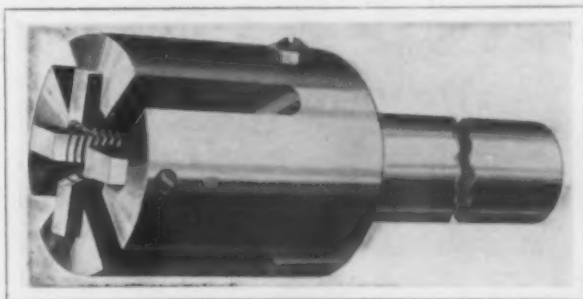
The monthly Bulletin of the American Iron and Steel Institute refers to the growing disposition on the part of both employers and employees to act well their parts in safeguarding against accidents. It is stated that as a result of this intelligent co-operation the number of accidents in iron and steel works is constantly decreasing and preventable human suffering is thus being greatly reduced. The figures for recent years show that the Illinois Steel Company has reduced its number of accidents by 70 per cent.; the Inland Steel Company by 55 per cent., and the Jones & Laughlin Steel Company by 71 per cent., while in the United States Steel Corporation the rate of reduction has been such that 11,074 men have been saved from serious injury or death since 1906.

Pipe Threading Die for Screw Machines

A new die for threading pipe on hand and automatic screw machines and turret lathes of any type on which pipe threads are cut has been brought out by the National-Acme Mfg. Company, Cleveland, Ohio. This die is not intended to supplant the special dies used on various types of machines built for pipe threading, but rather as an improvement over the button and spring dies used on turret machines on which duplicate parts requiring a pipe thread are made in quantities.

The die is made on the spring die principle but inserted chasers are used and the die is held on a shank instead of in a holder like a standard spring die. The use of inserted chasers, requires, of course, that the die body be considerably larger in diameter than that of the standard spring die of equal cutting size. The prongs of the body are therefore very wide with plenty of metal to give stiffness under cutting strains. The prongs are broached for the chasers which extend back into the body only far enough to accommodate the longest pipe thread likely to be cut. The chasers are held in position in the slots by shoulder screws and dowel pins, the former passing through the body and seating the chasers solidly in the bottoms of the slots. The dowel pins are fixed into the body and fit into the holes of the chasers, to relieve the screws of end thrust. The chasers are accurately hobbled and cleared to cut freely.

The shank is furnished rough or finished to fit the turret hole of any machine. The large or die end of the shank has a free fit in the die body to allow the die to center itself on the work should the work be rough or not quite true. A heavy dog point screw passing through the die body into the shank and held by a counter-sunk hexagon nut, furnishes the drive between the die body and the shank. Adjustment of cutting size is obtained



A New Die That Has Been Developed for Threading Pipe on Hand and Automatic Screw Machines and Turret Lathes. The Special Features of This Die Are the Use of Inserted Chasers and the Holding of the Dies on a Shank

through the clamp collar, which is of an improved pattern. Four bearing surfaces are provided in the clamp collar to bear directly on the prongs, the stock between these bearing surfaces being cut away. It is claimed that this clamp collar gives a much truer and more uniform adjustment than the old type of clamp collar.

The Pinney & Boyle Company, 1325 Palmetto street, Los Angeles, Cal., is completing a new plant at Vernon, a suburb. The structure is of steel and fireproof construction and contains 90,000 sq. ft. of floor space, about double the present capacity of the company's buildings. It will be used for the manufacture of the present lines, including special tinware, sheet-iron products, gasoline pumps, etc. The present equipment of the company will be removed to this plant about February 1, and no large amount of new equipment is contemplated for the next few months.

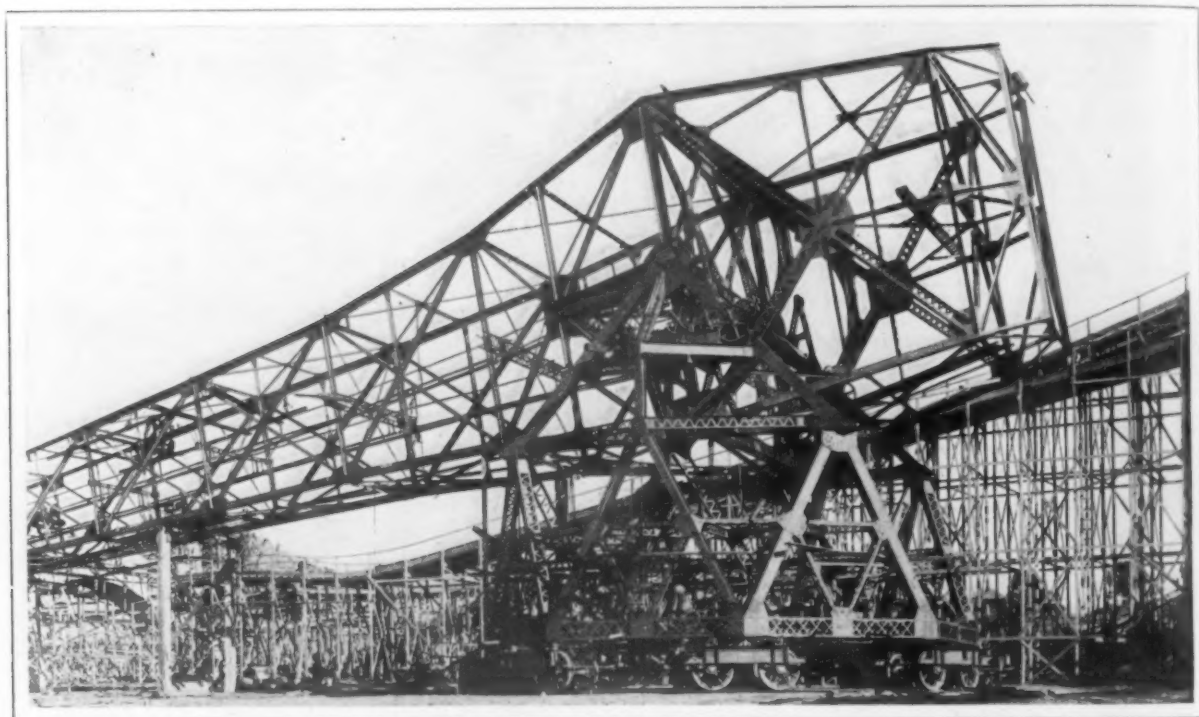
AN ANCHORED AIRSHIP

Structural Amusement Device for Panama-Pacific Fair Weighing 620 Tons

An anchored airship known as the Aeroscope, will be one of the conspicuous amusement features of the Panama-Pacific International Exposition at San Francisco. It is the invention of J. B. Strauss, of the Strauss Bascule Bridge Company, Chicago. From the top of a steel tower 60 ft. in diameter at the base and 50 ft. high, extends a counter-balanced arm 240 ft. long, which is manipulated in the same general way as a modern single-leaf bascule bridge, and at the outer end of the arm is a suspended car holding 120 persons and the whole contrivance rotates, the tower resting on wheels which travel a circular track. The object is to give the passengers a birdlike gliding sensation.

trunnions, and carries a solid block of concrete weighing 600,000 lb., which is calculated to serve as a counterbalance for the weight of the long arm and the fully loaded car at its extremity.

The car is two stories high and measures 19 x 38 ft. in plan. The sides of the car have large plate glass windows, and an unobstructed view is secured from each seat. The doors are of steel and must be securely locked before the car can ascend, the locking of the doors automatically completing the circuit which furnishes current to the operating motors. As soon as the car has been raised sufficiently to clear the adjoining buildings, two 15-hp. motors, which are connected to the eight trucks, are started and give the car the gliding effect. The arm is raised by two 11-hp. motors in connection with a series of gears, the last of which meshes with a semi-circular rack, the slow movement of this gear on the rack corresponding exactly with



Part of a New Amusement Device Developed for the Panama-Pacific International Exposition Constructed Entirely of Structural Steel. The Structure Required 320 Tons of Steel and There Is a Concrete Counterweight Weighing 300 Tons

The entire device is constructed of steel, even to the furnishings of the passenger car, and 640,000 lb. of steel is required. The contract for fabrication was let to the Modern Steel Structural Company, Waukesha, Wis., early in June, 1914. Work was begun early in July by the George H. Griffin Company, Seattle, Wash., the contractor for the construction. A circular foundation of rock ballast, 70 ft. in diameter and 2 ft. thick was made to support a number of heavy wooden ties. A 90-lb. rail, forming a circle 61 ft. in diameter, was placed on these ties and the structure is supported by eight trucks, spaced at equal intervals.

The 50-ft. tower, pyramidal in form, was built directly over the trucks and at a point 35 ft. from the ground, the sides of the pyramid make a sharper angle toward the apex, for the main trunnion bearings on which the arm rises and falls. These bearings consist of opposite cylindrical projections from the sides of the arms, forming an axis about which the arm is turned in a vertical plane. The arm is 215 ft. from this trunnion bearing to a similar one, from which the car is pivoted, and is built of heavy steel shapes. The opposite end of the arm extends 30 ft. on the other side of the main

the motion of the arm. Automatic stops are provided in case the mechanism should become deranged, and the whole structure is evenly balanced, so that it can be lowered by human power, thus doing away with the likelihood of a carload of passengers making an enforced stay of several hours in the air at a height of 265 ft.

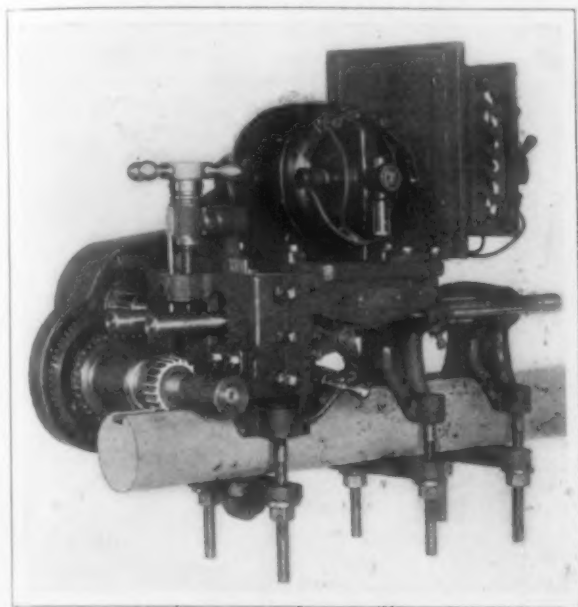
Propellers assist the motors in raising the arm. The propeller blades, measuring 8 ft. from tip to tip, are located 27 ft. down the arm from the car and travel parallel with it, two 3-hp. motors being used to operate them.

To keep the car in a vertical position at all times, a pipe-toggle system, consisting of two steel pipes, 3½ in. in diameter and extending from the tower along the sides of the arm to the car, was conceived. The ends of these pipes turn in journal bearings secured to the car and tower, and these four points form a parallelogram which maintains the car in a vertical position. To provide for the varying weight of the passengers, water ballast is employed, self-regulating valves controlling the amount of water used. When the car is entirely filled the tanks empty automatically, but if the load in the car should be 500 lb. short of the maximum

amount, the gauge would indicate that fact and the valve would admit that amount of water and then close. These tanks rest just above water pipes with patented valves which, when they come in contact with the correct protrusion, open and admit the proper amount of water.

A Portable Shaft Keyseating Machine

To enable keyseats to be milled in the ends or middle of shafting without removing it from the hangers or boxes, a motor-driven machine has been brought out by John T. Burr & Son, 429 Kent



A Portable Machine for Cutting Keyseats Which Is Clamped on the Shaft That Is To Be Machined, Thus Avoiding Its Removal from the Journal Boxes

avenue, Brooklyn, N. Y. The machine is portable and can be taken directly to the work to be done. It is a development of the builder's portable hand-operated machine which has been on the market for some time. The capacity of the machine is keyseats 12 in. long, in shafts having a maximum diameter of 5 in.

A rolling support is provided under the cutter head at all times to enable the machine to operate without jar or chatter and produce keyseats with straight sides and smooth bottoms. Automatic feed is provided for use while cutting, and this can be released at any predetermined point by an automatic trip. The feed screw has a squared end, and in resetting the machine after the completion of a cut, the feed is tripped and the screw turned with a ball handle provided for the purpose. The feed nut is of bronze and can readily be replaced from stock. The worm in the feeding mechanism is of steel and drops entirely out of mesh when the automatic trip operates. Lifting the ball handle on the end of the worm spindle serves to re-engage the feed. Two clamp heads are employed to hold the machine firmly to the shaft that is being keyseated. One of these carries a feed nut and always remains back of the main or cutter head which is fed along the shaft as the cut progresses, the roller binder being tightened only sufficiently to take up the jar of the cut.

A removable outboard bearing is provided for the cutter arbor, and the cutters are centrally located by an expansion collar placed between the main arbor collar and the cutter. The equipment of the machine includes a set of cutters, and by using one or more of them simultaneously keyseats ranging from $\frac{1}{4}$ to $1\frac{1}{8}$ in. in width may be milled, the varia-

tion between any two combinations of cutters being $\frac{1}{16}$ in. The main head and slide are machine finished and scraped, and an adjustable gib fastens the two parts together. The gears and the worm-wheel are cut from the solid, and the cutter slide has an adjustable gauge showing the depth of keyseat being milled.

The following table gives the principal dimensions and specifications of the machine:

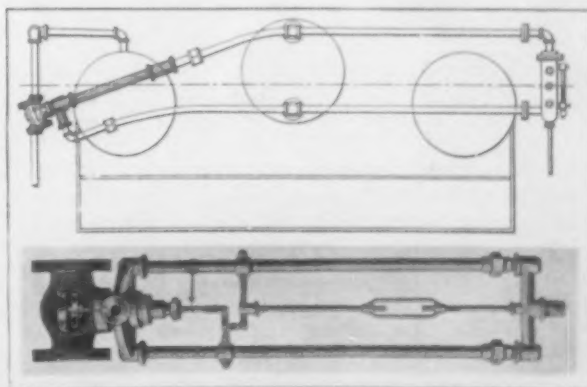
Maximum diameter of shafting handled, in....	5
Maximum length of keyseat milled, in.....	12
Number of cutters in set.....	5
Minimum width of keyseat milled, in.....	$\frac{1}{4}$
Maximum width of keyseat milled, in.....	$1\frac{1}{8}$
Net weight, lb.....	175
Shipping weight, lb.....	225

Motors for almost any standard voltage of direct or alternating current are furnished with the machine, the current required for operation being taken from the nearest lamp socket through a flexible cord and screw plug. The motor is mounted on a platform, which is bolted to the cutter slide, and transmits power to the spindle through a train of gears that is entirely protected by a cast-iron case.

An Automatic Feed Water Regulator

The McDonough Automatic Regulator Company, Detroit, Mich., is manufacturing an automatic feed water regulator of the thermostatically controlled type. It is designed to secure a continuous feed and to vary automatically the amount of water fed to the boiler in proportion to the load. The rate of the feed is proportional to the evaporation and a practically constant water level is claimed to be maintained for light and uniformly varying loads. Sudden increases in the load, accompanied by a resulting rapid drop in the water level, do not, it is pointed out, cause the regulator valve to open suddenly and admit a large quantity of water into the boiler, as there is a time element in the expansion of the tubes operating the valve which uniformly increases the amount of water fed. This arrangement is calculated to allow the immediate furnace heat to be used for the evaporation of the water already in the boiler and not for heating a quantity of cold water.

The regulator comprises two headers and two expansion tubes connected in parallel through a set of rigid links to the stem of the feed valve. As indicated in the accompanying drawing, the lower ends of the tubes are filled with water and the upper with steam under ordinary operating conditions. Changes in the water level in the boiler produce corresponding variations in the regulator tubes and present a greater or less portion of the tube surface to the hot steam, causing them to expand or contract accordingly. The inclined position of the regulator is to give maximum variation in exposed tube surface for a given variation in water level and corresponding sensitiveness to variations in load.



Views of a New Feed Water Regulator with Automatic Thermostat Control Showing the Complete Device with the Method of Installing Above

X-RAY INSPECTION OF STEEL

A Novel Application in the Detection of Holes in Castings

An article by Dr. Wheeler P. Davey, of the research laboratory of the General Electric Company, Schenectady, N. Y., in the General Electric Review, describes the most recent commercial application of the X-ray in part as follows:

Possibly the question of observing the pipe in a steel ingot by the use of the X-ray, thereby being able to determine just where the ingot should be

sired shape and thickness. The amount still to be taken from the faces was not more than $\frac{1}{8}$ in. and in some places was only $\frac{1}{16}$ in., but when this was removed it was found that some small imperfections had been cut into. These extended over an area about five inches long and one and one-half inches wide. The mechanical department at once chiseled away a part of the surface at this point, and then sent the casting to the research laboratory to determine if, by means of an X-ray examination, it might be possible to reveal still other hidden blow holes or imperfections.

A Coolidge tube, especially made for use on high voltages, was set up in front of that part of the cast-

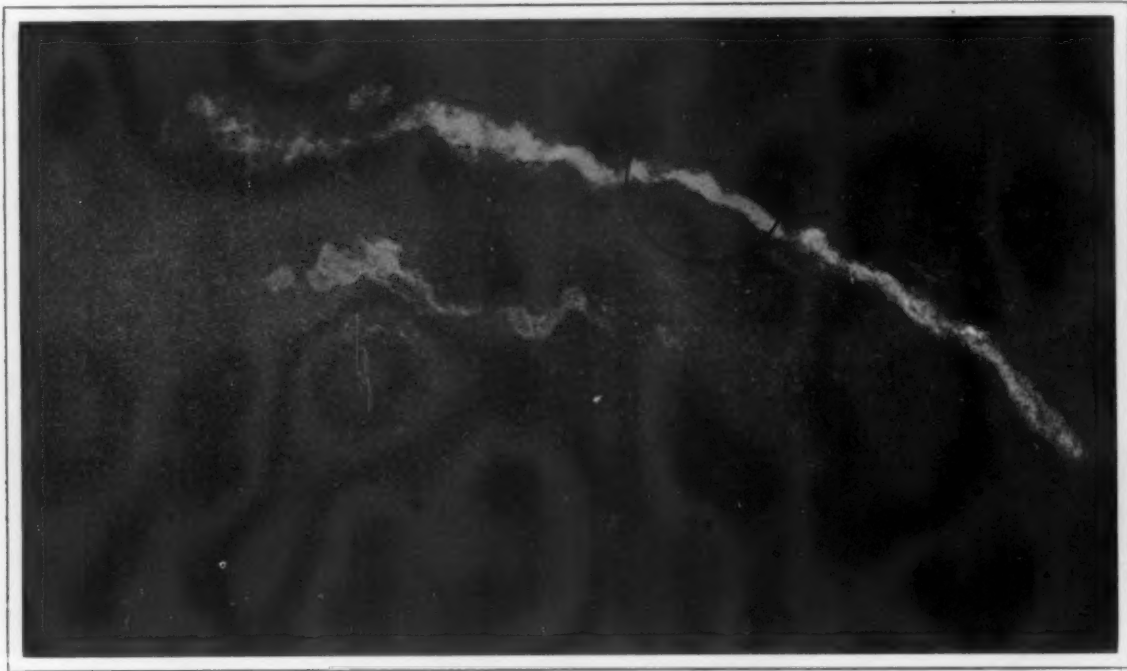


Fig. 1—Radiograph of a Steel Casting Showing Flaw in the Center of the Casting. The Circle Shows Where a Piece Was Later Punched from the Casting



Fig. 3—Edge of Button Cut from the Casting (See Fig. 1) Showing Position of Hole. Button Was $\frac{9}{16}$ In. Thick

Fig. 2—Top Surface of the Casting When the Piece Was Punched Out. The U Is an Identifying Mark

Fig. 4—View of the Edge of the Button Opposite to That Shown in Fig. 3

cropped may seem still somewhat removed, at least in so far as commercial applications are concerned. There is no inherent impossibility in the process, however. It is the object of this article to describe in detail what has already been done in the way of an X-ray examination of a certain steel casting of which suspicion had been aroused as to its homogeneity when in the machine shop.

The original casting was $2\frac{1}{2}$ in. thick and weighed about a ton. When received at the Schenectady Works of the General Electric Company it had been machined down to approximately the de-

ing where the imperfections had been found. An 8 by 10-in. Seed X-ray plate was mounted immediately behind the casting and the plate was backed by a large sheet of lead. The distance from the source of X-ray to the plate was 20 in. The tube was excited by an induction coil with a mercury-turbine interrupter. The current through the tube was 1.25 milliamperes and the potential across the terminals of the tube corresponded to that sufficient to break down a 15-in. spark gap between needle points. The X-ray plate was exposed two minutes. At the place where the radiograph was taken, the

finished casting was about nine-sixteenths of an inch thick. The radiograph obtained is shown in Fig. 1. The casting was then moved eight inches and another radiograph made. In this way a number of exploratory radiographs were taken through different points of the casting.

All the radiographs showed plainly the tool marks on the surface of the casting. All but one showed peculiar markings which were of such shape as to strongly suggest that they were indeed the pictures of holes in the interior. In the words of the surgeon, it was decided "to confirm the diagnosis by making an exploratory incision." A circular piece, one inch in diameter, was punched from the casting at a point where one of the radiographs indicated that a blow hole should be found. (Location of sample shown by circle on Fig. 1.) Fig. 2 shows that the surface of the casting was entirely free from blow holes at the point where the button was removed. Figs. 3 and 4 show the ends of the hole in the button.

This has proved, then, that with the proper X-ray exposure blow holes or cavities may be disclosed in apparently solid metal of considerable thickness. A careful comparison of the X-ray photograph and the button photographs leads to the conclusion that very small air inclusions are made visible; and the fact that the tool marks are plainly visible on the X-ray plate confirms this fact.

Such studies point to the desirability of great care in metal casting where imperfections, ordinarily invisible, are of great danger, and where X-ray analysis or some other method is not used to check them.

NOVEMBER FOREIGN TRADE

Value of Iron and Steel Exports Less Than for October—Tonnage Imports Increase

The gain in the value of the exports of iron and steel and manufactures thereof shown by the reports of the Bureau of Foreign and Domestic Commerce for the months of September and October, 1914, was not maintained in November. These amounts, which rose from \$10,428,774 in August to \$16,445,832 in October, have fallen off slightly to \$15,689,401 for November, a loss of 4.6 per cent. from the previous month and only about 78 per cent. of the total value for November, 1913. The value of the iron and steel and manufactures thereof imported in November, 1914, was \$2,157,450, against \$2,069,433 in October and \$2,495,093 in November, 1913.

The total values of exports of iron and steel and manufactures thereof in the 11 months ended with November, 1914, was \$184,922,071, against \$271,818,459 in the corresponding period of 1913; while figures for imports were respectively \$27,104,666 and \$30,787,211.

The exports for which quantities are given continue to approach the shipments for similar months in 1913. These amounted to 41.3 per cent. in August, 45.3 per cent. in September, 66.8 per cent. in October and 79.8 per cent. in November of the quantities exported in corresponding months in 1913. While the November aggregate was only 140,752 gross tons as compared with 147,293 tons in October, large gains were made in pig iron, wire rods, wire nails, galvanized iron sheets, steel plates and barb wire. The gains were: Pig iron, 5,524 gross tons to 10,139 tons; barb wire, 15,130 tons to 17,791 tons; wire rods, 5,716 tons to 7,110 tons and horseshoes, 905 tons to 1,263 tons. Steel-rail exports dropped off sharply from 22,057 tons in October to 9,283 tons in November, and steel sheets exported were only 5,741 tons as against 10,003 tons in October. The total value of iron and steel exports for which tonnages are given was \$5,782,134 in November, 1914, as against \$6,837,007 in November, 1913. The average value per ton of these exports was \$41.08 in November, 1914, as compared with \$38.95 in November, 1913.

Details of the exports of these tonnage commodities in November and the 11 months ended with November, compared with the same periods of the previous calendar year, are as follows:

	November		Eleven Months	
	1914	1913	1914	1913
	Gross tons	Gross tons	Gross tons	Gross tons
Pig iron	10,139	18,353	107,677	252,208
Scrap	1,334	11,334	31,623	89,740
Bar iron	462	2,508	4,842	15,963
Wire rods	7,110	1,032	54,421	54,231
Steel bars	12,344	15,873	101,005	196,804
Billets, ingots and blooms, n.e.s.	7,033	1,052	47,066	89,615
Bolts and nuts	751	1,469	14,071	20,852
Hoops and bands	1,500	1,261	9,248	15,399
Horseshoes	1,263	110	4,216	1,133
Cut nails	58	250	3,285	3,402
Railroad spikes	321	451	6,769	10,749
Wire nails	4,895	2,593	32,249	40,574
All other nails, including tacks	321	277	2,876	3,610
Pipes and pipe fittings	10,231	18,886	104,487	280,092
Cast pipes and fittings	8,267	.....	135,314	.....
Wrought pipes and fittings	267	.....	148,151	.....
Radiators and cast-iron house heating boilers ..	202	263	3,300	7,574
Steel rails	9,283	24,911	171,113	438,035
Galvanized-iron sheets and plates	4,440	4,129	37,372	73,411
All other iron sheets and plates	338	1,106	7,352	21,571
Steel plates	10,508	9,274	104,832	210,942
Steel sheets	5,741	6,716	113,208	130,562
Structural iron and steel ..	11,146	35,802	171,637	378,510
Tin and terne plates	4,837	2,500	55,572	55,421
Barb wire	17,791	7,426	85,514	74,188
All other wire	10,437	8,844	74,548	99,378
Totals	140,752	176,420	1,431,748	2,563,964

*Figure is for six months, January to June, inclusive.

†Figures cover period since June 30.

In November the imports for which quantities are given amounted to 24,165 gross tons, as against 22,754 tons in October, 38,420 tons in September and 25,810 tons in November, 1913. In spite of the present hindrance to foreign commerce, this country imported in November more scrap, structural iron and steel, steel rails, sheets and plates and tin and terne plates than in the same month in 1913. Bar iron and "all other" pig iron alone show an appreciable falling off. The iron and steel and manufactures thereof imported in November, 1914, showed an average value per gross ton of \$39.74, a lower value by \$2.48 than the corresponding value for November, 1913.

Details of the imports of tonnage commodities in November and the 11 months ended with November, 1914, as compared with the corresponding periods of the previous calendar year, are as follows:

	November		Eleven Months	
	1914	1913	1914	1913
	Gross tons	Gross tons	Gross tons	Gross tons
Pig Iron (Including ferro-silicon)	251	318	5,842	*120,612
Ferro-silicon	11,174	13,443	129,383	†22,765
All other pig iron	3,830	2,754	32,753	42,841
Scrap	790	2,302	15,261	26,914
Bar iron	1,212	465	10,051	10,618
Structural iron and steel ..	.....	.....	1648	.....
Hoop or band iron .....	.....	.....	.....	*17,765
Ingots, blooms and steel billets	2	857	1,849	†1,631
Steel billets without alloy	2,788	2,452	36,498	†4,470
All other steel billets	2,339	1,621	22,320	8,766
Steel rails	497	117	4,241	2,702
Sheets and plates	364	202	15,180	15,939
Tin and terne plates	918	1,279	6,876	15,158
Wire rods .....	.....	.....	.....	.....
Totals	24,165	25,810	280,902	290,805

*Figures cover period January 1 to October 3, inclusive.

†Figures cover period beginning October 4.

‡Figures cover period beginning July 1.

Imports of iron ore in November amounted to 90,222 gross tons against 114,341 tons in October, 109,176 tons in September and 179,727 tons in November, 1913. For the 11 months ended with November 1,300,315 tons were imported as compared with 2,370,878 tons for the same period of 1913.

The Cambria Steel Company, Johnstown, Pa., has sold 66 houses, most of them built to accommodate two families, to employees who are now occupying them. Prices ranged from \$800 to \$2100, and the employees will pay for them on a monthly payment plan.



Model Factory Building for Small Plants

Flexible Partition Arrangement in Toledo, Ohio—Structure Designed to Accommodate Growing Industries with Modern Shop Rooms—Unusual Heating System

Small light manufacturing plants located in rented quarters are often seriously handicapped by being compelled, for lack of better accommodations, to occupy old, out of date buildings with few of the advantages of modern factory buildings. With poorly arranged factory space in fire-trap structures and improper lighting, heating and ventilating, their overhead charges are high and consequently the cost of production is excessive. Some plants require such a small space that the erection of a factory building is not practical, and owners of other industries do not care to tie up their capital in factory buildings.

Toledo, Ohio, is a city that has solved the problem of providing adequate factory facilities for small industrial companies and has solved this problem in an interesting manner. The carrying out of the plan adopted has resulted in the erection of a factory building that, in addition to being thoroughly modern, is unique in a number of particulars, one of the most important of which is the flexibility of the interior arrangement so that a tenant can secure the amount of space he needs and can acquire additional units of space as the growth of his business warrants.

The movement to erect the factory building originated with the Toledo Commerce Club, which, after investigating conditions, found that it was difficult to secure suitable space for light manufacturing in that city. This lack of accommodations interfered with the establishment of new industries there. It checked efforts to induce companies with plants elsewhere and looking for a new site, or a new company looking for a favorable location to locate in that city. The Commerce Club, as an organization, was unable to undertake the erection of a factory building, but a company known as the Toledo Factories Company was organized within the membership of the club, practically all the members being stockholders. To finance the project a \$100,000 5 per cent. bond issue was authorized. The bonds were taken by some of the leading local banks, and \$194,000 in common stock was sold. While the primary object was to help the city, the details of

the project were carried out with the idea of making it a safe financial investment with a fair turn for the stockholders. Earnings have been sufficient to warrant the directors to authorize recently the payment of dividends at the rate of 4 per cent. per annum on the stock.

The site selected was a $3\frac{1}{2}$ -acre tract occupying a block on a car line convenient to the railroad depots, docks and downtown section of the city. In view of the fact that none of the tenants would receive his raw material or ship his products in car lots, the advantages of the site selected, including the purchase of a large tract of land at a comparatively low cost, were regarded as overbalancing those of a site adjoining a railroad siding.

The building is a 4-story, reinforced concrete structure built in two main sections or units, each 200 x 90 ft. in plan and connected by an intermediate section 66 x 66 ft. This is taken up for the most part with the elevators, stairways and office space, and on the ground floor with the main entrance and loading platforms. There is an extension to the second unit similar in dimensions to the one that connects the present two units and to this will be connected two additional units, which the company plans to build when the demand for space warrants the doubling of the present floor space. The power plant is located in the basement of this section. No basement space is provided in other parts of the plant. The present units provide approximately 160,000 sq. ft. of rentable floor space.

Three rows of reinforced concrete columns extend the length of the building, the columns being spaced 22 ft. on centers, each way. With the exception of the space taken by the pilasters, the entire side wall space from the floor to the ceiling, which is 12 ft. high, is fitted with 12 x 18 in. plain glass set in Fenestra steel sash. There are 29,000 panes of glass in the building. The large amount of glass surface provides the maximum amount of outside lighting and as the interior space is so divided that every tenant has outside window surface, every occupant has an abundance of light. The floors are of the slab construction and are designed

to stand a weight of 200 lb. per sq. ft. The type of building permits the use of heavy and high speed machinery with no perceptible vibration, and the building is equally adapted for metal working shops or for other lines of light manufacturing where machinery is required.

The building is sub-divided in space to suit the requirements of tenants by means of 4 in. Egyptian tile partitions erected between the columns. The removal or erection of partitions to suit the requirements of tenants involves little expense. The sub-divisions are made in units ranging from 1000 to 40,000 sq. ft. Most of the tenants use 3000 sq. ft. of space. A number started with 1000 sq. ft. and as their business has grown have increased their space to 3000 sq. ft.

The rental rates run from 19 to 24 cents per sq. ft. per year, depending on the size of space taken, the average being about 20 cents. This price includes heat and ventilation, the installation of an automatic sprinkler system and the ordinary water supply, an extra charge for water not being made unless a considerable amount is used for manufacturing purposes. With the fireproof construction of the building automatic sprinklers and other safeguards against fire, the insurance rate is much lower than in old types of buildings having little or no protection against fire. The maximum insurance rate for tenants is 15 cents per \$100 per year. The floors are connected by two Houghton Electric & Machine Company's electric elevators, one a 3-ton freight elevator and the other a passenger elevator. The loading platforms on the ground floor directly join the freight elevator.

The heating and ventilating of the building is unusual for a structure used for manufacturing purposes. Owing to the fact that the building is occupied by a number of tenants, there are frequent changes in partitions due to the changes in occu-

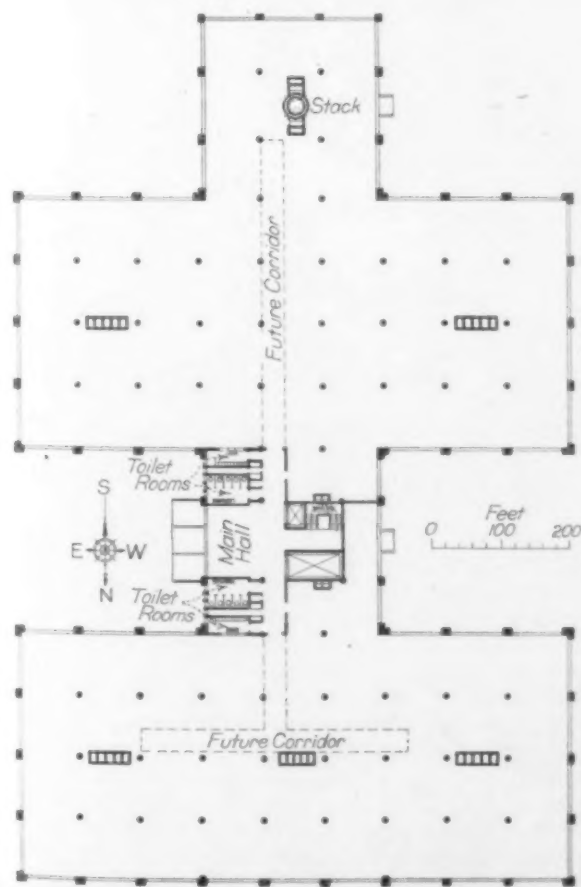
pancy and the desire of some tenants to increase their floor space. These conditions necessitated a flexible arrangement of the heating and ventilating system. Owing to the large amount of window surface very little wall space was available for radiation, and ceiling radiation was impracticable because some of the tenants desire attractive looking rooms. For these reasons the all indirect system was determined upon. The principal advantage in heating the building with direct radiation lies in the fact that the rooms may be warmed without mechanical intervention. The plant was designed to accomplish this result without radiators by placing the heating surface at the bases of large vertical air ducts. This, it is claimed, has worked out with excellent results. All of the factory rooms are supplied with fresh air without the necessity of opening any of the outside windows.

There are five main indirect heating chambers connected with a fan by large concrete air ducts arranged for easy inspection and cleaning and provided with electric lights so that one may walk freely to all parts of the distribution system. To minimize the operating cost, the fan and tempering coils are placed adjacent to the boiler room, and the fan is driven by a steam engine, the exhaust steam from which is utilized for heating. Steam is circulated at a vacuum, thermostatic traps and a vacuum pump being used in connection with the system. The air delivery throughout the building provides a change for about every 15 min. Space is left for the future installation of an air washer, but owing to favorable surroundings, this is not required at present.

The fresh air supply is taken from the outside into an air shaft and through a Sirocco fan with a capacity of 138,000 cu. ft. per minute when operated at 125 r.p.m. and driven by a 50 hp. steam engine. The air is drawn through tempering coils, a temperature of 68 deg. being automatically maintained by means of the thermostat that controls a by-pass damper under the tempering coils. As it passes through the tempering coil the air is humidified by steam jets from three horizontal pipes located on the warm side of the coils. These jets are controlled by a diaphragm valve regulated by a humidostat.

The tempered air passes into a main 7 x 8-ft air duct of concrete that extends the length of the building under the corridor and from which branches lead to five plenum chambers provided with four sections of Vento cast-iron radiation. These heating stacks take low-pressure steam. Automatic temperature control and dampers are provided throughout the building, each room having a thermostat which controls the temperature without changing the volume of the air. The thermostats, in order that they may not be unduly interfered with by an unauthorized person, are placed in the vent flues where they are subjected to a constant fair sample of the air coming from the rooms which they control. They are set to operate at a temperature a little lower than they would be set for were they located in the ordinary manner in the rooms.

The flues are arranged in banks of five, four of these being heat flues, one of which supplies a floor in that section of the building and the fifth being a vent flue for the first floor. A heat flue that supplies warm air for the first floor becomes a vent flue for the second floor and so on, so that only five flues are required to serve the four floors. Some of the separate heat flues are 30 x 30 in. and others are 24 x 30 in. When small subdivisions of the rooms are required horizontal supply and vent ducts are provided at the ceiling. The fresh air is taken into



Typical Floor Plan to Indicate the Possibilities of Subdivision to Suit Needs of the Factory Tenants



The Character of the Interior Is Indicated in this View of the Die Casting Room of the Doehler Die-Casting Company

the rooms near the ceilings through adjustable diffusers. In many of the rooms there are ventilation openings at both floor and ceiling, the lower opening being used in winter. The upper openings are for additional ventilation in the summer, or when fumes arise from manufacturing processes. The various groups of vent flues terminate in heavy ventilators on the roof.

For heating and ventilating office rooms in the section between the two main wings there are two double flues, one on each side of the elevator shaft, and the tempered air as it comes from the flues is blown through the coils of radiators located before the outlets. The corridors are heated by tempered air that comes from the main air duct through the elevator shaft, this air supply being regulated by pneumatically controlled dampers. Direct radiation is provided for the toilet rooms.

A re-circulating system is provided for use during the night when the building is not occupied and fresh air is not essential. The outdoor supply of fresh air is shut off and the air in the building is re-circulated, being drawn to the fan through the corridors and elevator shafts. To prevent the drawing in of outside air through the ventilators dampers are provided at the top of the vent flues that are pneumatically closed by a switch in the basement. Steam for the heating system and for power is furnished by two 250-hp. water-tube boilers, equipped with hand-fired smoke-consuming furnaces.

The accomplishment of results without direct radiators is said to have been most satisfactory as there are no obstructions, no local overheating and no radiators to interfere with in the moving of partitions. The fuel cost for heating for the season 1913-1914 was \$3009. This is \$1.22 per 1000 cu. ft. of contents for the season, or \$16.80 per 1000 sq. ft. of floor surface. It is stated that the temperature of the building has been at 70 deg. at 7 o'clock in the morning during the coldest weather of the heating season, when the outside temperature has been as low as 3 and 4 deg. below zero. A test

was made during the severest cold weather, and when the temperature was 70 deg. in the center of the room it was 69 deg. one foot from the glass surface in the most exposed room in the building.

Another unusual feature for a manufacturing plant are the sanitary arrangements. There are four toilet rooms in each floor, one each for the office and shop men and one each for the office and shop women, the two for the men being adjoining on one side of the corridor and the two for the women being on the opposite side. Each toilet room is provided with four washstands and two closets. Each bowl is vented, the air being taken through a porcelain duct connected with a pipe that leads back of the fixtures into a narrow chamber separating the two adjoining toilet rooms. Through these chambers an air shaft extends up to the pent house above the roof, where the air is exhausted by a fan. The closets are connected with flush valves, all the parts of which, except a push button, are located in the chamber back of the toilet rooms. In this chamber are located, where they cannot be tampered with, all pipes connected with the toilet rooms.

Tenants are supplied with electric current, natural and artificial gas, compressed air, steam for manufacturing purposes outside of power, this being furnished on a metered basis, and hot and cold water by separate lines running to each user from the center source of supply. Electricity for power and light is purchased from a commercial company, being stepped down from 4300 volts to 220 and 110 volt 3-phase 60-cycle current. As the building company buys the electrical current direct and apportions the cost among the tenants according to the amount that each uses, a lower rate is secured, because of the increased consumption, than if each user paid the regular commercial rate for the amount consumed. While the largest consumer can buy his current outside at the same rate he is now paying, other tenants are saving as much as 20 per cent. on power. Steam for manufacturing purposes is distributed through a main riser with a header on each floor and supply lines from the header.

Besides the reduction of the power bills there are other interesting co-operative features in connection with this plant. The building maintains a general stock room where such general supplies as waste, oils, electric lamps and fuses are furnished as a matter of convenience at practically cost. The management has secured lower trucking rates than would be available were each tenant acting independently. An emergency hospital room is maintained by the management at a central point, where first aid is rendered in case of sickness and accident. A restaurant is conducted in the building, under the supervision of the management to insure satisfactory service. Here a regular noon-day meal is served to shop employees for 15 cents and office employees who desire can have their lunches sent to their offices.

At this writing 94 per cent. of floor space is occupied and the tenants appear to be well satisfied. About one-half the tenants are new companies organized in Toledo and one-third are companies that moved there from other places, the remainder being industries that occupied other quarters in Toledo. While the building is adapted for various lines of manufacture, a large part of the space is taken by companies engaged in metal working industries. The metal working companies occupying the building are the Doehler Die-Casting Company, the Toledo Drill & Tool Company, the City Machine & Tool Company, the O'Neil Machine Company, the United Wire Tie Company, the Webb Press Mfg. Company and the Dewey-Anderson Company.

Ohio Corrugating Company

The Ohio Corrugating Company, Warren, Ohio, recently incorporated with a capital stock of \$50,000, will engage in the manufacture of all forms of roofing and siding, corrugated sheets, stove pipe, wall ties, eaves trough, conductor pipe, metal shingles, blue sheets, bright coke and charcoal tin plate, and open-hearth ternes. The company has completed its organization by the election of the following officers: President and treasurer, W. Manning Kerr, formerly assistant secretary and treasurer of the Dollar Savings Bank Company at Niles, Ohio; vice-president, C. H. Riegel, formerly connected with the Deforest Sheet & Tin Plate Company, Niles, Ohio; secretary and manager of sales, I. A. Foltz, formerly with the Garry Iron & Steel Company, Niles. These officers and William H. Stevens and G. P. Gillmer comprise the board of directors. The company is prepared to ship at once all of its manufactured product and is planning the erection of a new plant, about 80 x 300 ft., to be located on South Pine street, Warren, Ohio.

The general offices of the Asbestos Protected Metal Company, including the executive, accounting, sales and engineering staffs, will be moved February 1 from the Beaver Falls plant to the First National Bank Building, Pittsburgh. The manufacturing operations of the company will continue as heretofore, at Beaver Falls, Pa., and at Waltham, Mass.

FRICK COKE COMPANY HEAD

Walter H. Clingerman Elected—Clay F. Lynch General Superintendent

At a meeting of the board of directors of the H. C. Frick Coke Company, held in its general offices in the Carnegie Building, Pittsburgh, on Monday, January 18, Walter H. Clingerman, formerly general superintendent, with headquarters at Scottsdale, Pa., was elected president of the company, to succeed Thomas Lynch, who died on December 29, 1914. Mr. Clingerman has been general superintendent of the Frick Coke Company for some years. At the same time, Clay F. Lynch, president of the Bunsen Coal Company, with offices at 208 South LaSalle street, Chicago, who is a son of the late Thomas Lynch, was elected vice-president and general superintendent, succeeding Mr. Clingerman in the latter position. Mr. Lynch will probably made his headquarters at the main offices of the Frick Coke Company in Scottsdale, Pa. Mr. Clingerman lives in Scottsdale and will not remove to Pittsburgh for some time at least.

Walter Hicks Clingerman started on his career as an apprentice in the machine shops of the Pennsylvania Railroad Company at Altoona in 1885, after passing through the public schools of Altoona. In 1889 he was transferred to the office of the superintendent of motive power as draftsman and in charge of construction work. He was given a leave of absence in 1895 to superintend the construction of car shops for the H. C. Frick Coke Company and put car repairs on a piece work basis. He returned to the railroad early in 1896. In September, 1897, he became general foreman of the Everson car shops of the H. C. Frick Coke Company and in 1898 was appointed assistant general superintendent of the company, becoming general superintendent in February, 1904. He is 46 years of age. He is a

director of the Memorial Hospital at Mt. Pleasant, Pa.



WALTER H. CLINGERMAN

Reclaiming Acid From Waste Pickle

A patent has recently been granted to A. F. Hoffman, a Pittsburgh chemist and engineer, on the recovery of sulphuric acid from waste pickle, the liquor resulting from the cleaning of iron or steel articles in sulphuric acid. Mr. Hoffman states that about 1500 tons of this acid per working day are used for pickling in the Pittsburgh district when the mills are running at normal capacity. Nearly all of this is discharged into the streams after use, resulting in great damage to boilers and other equipment where these waters are used for making steam. Mr. Hoffman's process requires the use of no chemicals. The apparatus is simple and not expensive. The acid is set free from the ferrous sulphate and the iron precipitated in a form which is valuable for the production of pigments or for abrasives for polishing metal or glass. These precipitates are valuable also for the purification of gas, water or sewage. Practically all the acid in the waste pickle it is claimed can be recovered by this process at a small part of the cost of new acid, not considering the value of the by-product, which is said to be worth at least half as much as the acid recovered.

Blast-Furnace Skips and Transfer Cars

An English Installation of the Eighteenth Century—First Skip Hoists and Transfer Cars in the United States Embody Modern Principles

—BY FRANK C. ROBERTS*

The history of the progress of the application of labor-saving devices to the filling of the blast furnace covers a much longer period than is usually supposed. It is generally assumed that the application of the skip hoist and the transfer car, for the delivery of materials to the furnace, originated in this country and within quite recent times. It was therefore with great surprise that in 1902 the writer was informed that both the skip hoist and transfer car had been installed many years ago at the Lowmoor furnaces, in England.

E. Windsor Richards, through whose kindness the illustration, Fig. 1, of the Lowmoor furnaces is supplied, was at an early period in his career (he is now 84 years old) manager of these works; in a recent letter to the writer Mr. Richards states that he "could never find out when the skip hoist was built, the natives used to say it was 100 years old, and it really looked as old as the furnace, which was erected toward the end of the eighteenth century." The date cut in the stonework of one of the furnaces is 1791. It is very instructive to note that while crude the construction and relative arrangement of the skips and transfer cars embody the main principles found in our modern equipment.

First Skip Hoist in the United States.—So far as the writer is aware, no further attempt was made to apply the skip hoist to the blast furnace until 1883, when the device was placed in use at the No. 1 furnace of the Stewart Iron Company, L't'd, at Sharon, Pa. In 1884 the Lucy furnace in Pittsburgh was equipped with a skip hoist, and subsequently a skip was applied to a furnace (now owned by the Carnegie Steel Company), in Steubenville, Ohio. In none of these instances, however, were mechanical means, such as transfer cars, employed to transport materials from the stock pile or bins to the skip, the skip car in each case being filled by hand barrows.

For some years but little further advance was

made. Several plants were equipped with bins arranged to discharge into barrows, but the progress of the application of mechanical means to the filling of the blast furnace came to a standstill.

In 1896 the Duquesne furnaces were built and equipped with various mechanical devices for the transfer of materials from the stock bins to the furnaces. The Duquesne equipment, as is well known, departs radically from the accepted form of skip hoist and provides that the bucket loaded at the bins is transferred on a car to the hoist, taken off the car by the hoist, elevated to the furnace top and discharged into the main hopper.

First Transfer Cars in the United States.—The writer believes that the first application in this country of the general principle of the modern transfer car, loaded at the bins and discharged into a skip car at the foot of the skip hoist, was made by The Johnson Company (now Lorain Works of the National Tube Company), at Lorain, Ohio, in connection with their A furnace, which went into blast July 5, 1899. It was the privilege of the writer and his former partner,

John B. Miles, to collaborate with Max M. Suppes, the general manager of the company, in designing this equipment in 1897. Fig. 2 shows, in general, the relative arrangement of the various parts. It will be noted that the railroad tracks on top of the stock bins are approximately at ground level and that the transfer car track is placed in a pit which extends along the front of the bins. The bucket carrying the materials is suspended from the transfer car; the latter is equipped with scales and is operated electrically.

This arrangement of stock bins, etc., is quite unusual and was found desirable by reason of the fact that the rock underlying the thin layer of soil consisted of soft shale, which could be readily cut and formed to meet the requirements, thereby avoiding an expensive superstructure. The hoisting equipment consists of a single counterbalanced skip.

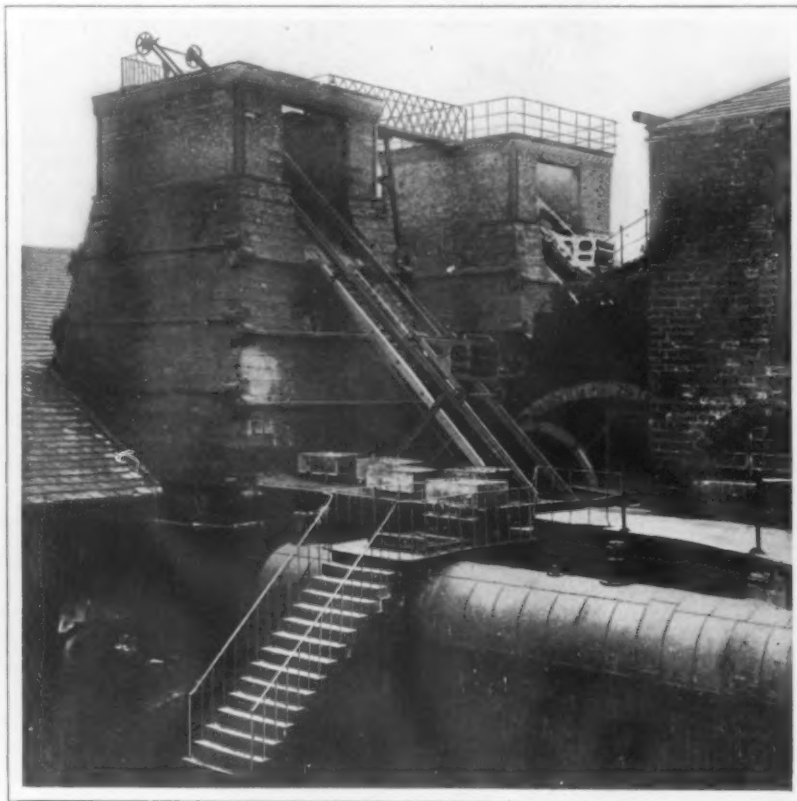


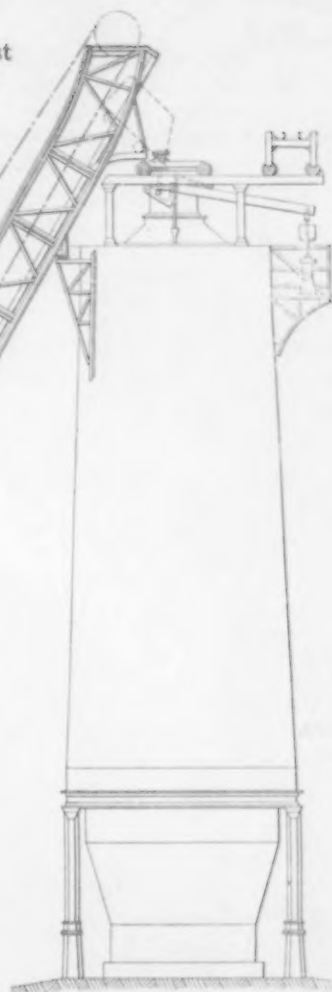
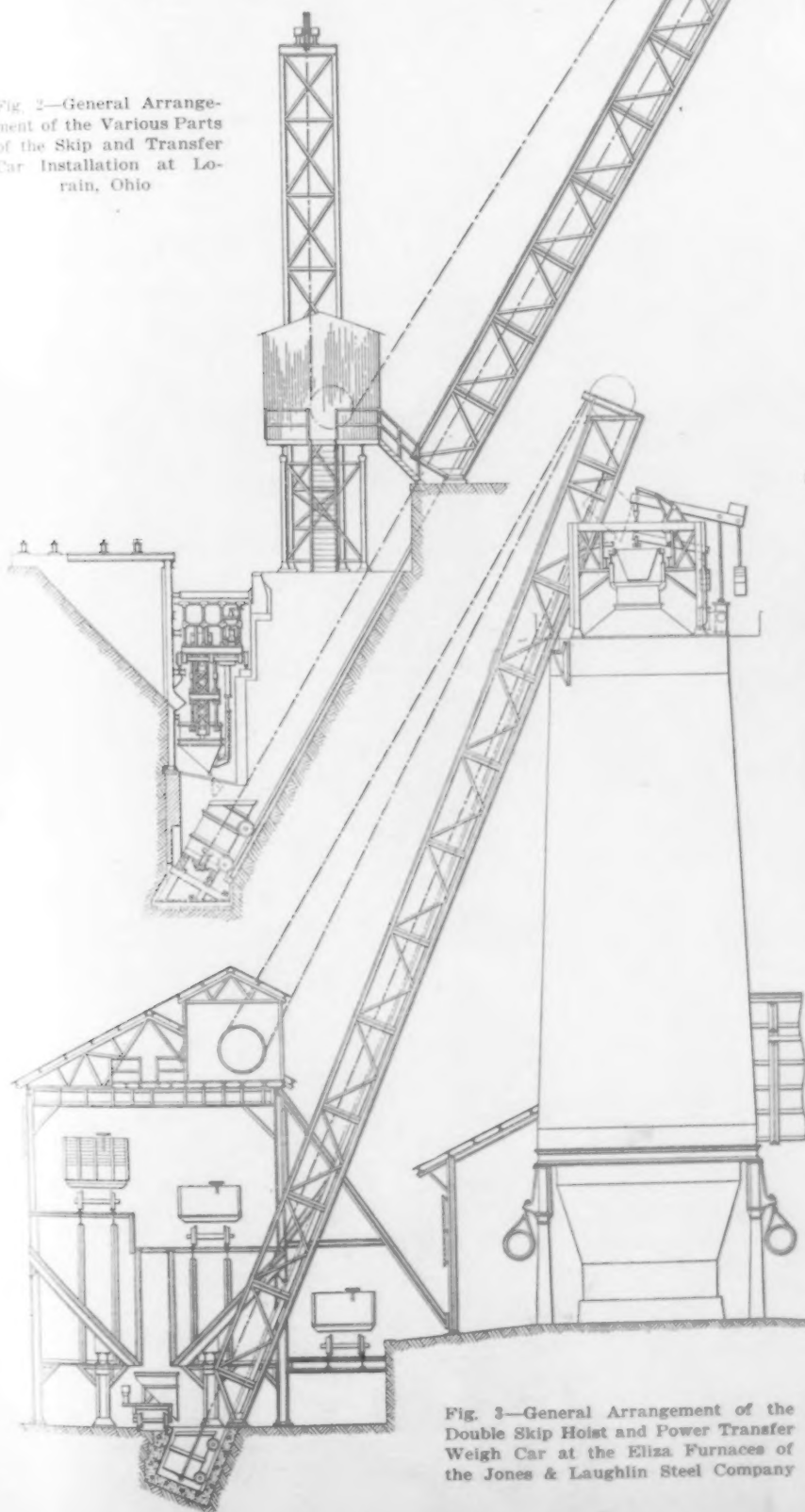
Fig. 1—Skip Hoist and Transfer Car Installation at Lowmoor Furnaces in England About 1790

*Consulting engineer, Philadelphia, Pa.

First Skip and Transfer Weigh Cars in the United States.—The first application, within the writer's knowledge, of the now generally accepted form of equipment, i.e., a double skip hoist and a power transfer weigh car operating at ground level, was that built in 1898-99 by Laughlin & Co. (now Jones & Laughlin Steel Company) for its Eliza furnaces at Pittsburgh, Pa., under the designs of the writer. Fig. 3 illustrates the general arrangement. The stock bins were built of steel and equipped with power operated gates. Materials were discharged through the latter into the hopper of the transfer car, weighed on the scale carried by the car, transferred to the foot of the skip and discharged into the skip cars. The transfer car was operated by electricity. The four furnaces of this plant were furnished with this equipment; the first to be completed (No. 2) went into blast August 29, 1899.

Since the construction of the Eliza furnaces, there have been many modifications in the detail of the de-

Fig. 2—General Arrangement of the Various Parts of the Skip and Transfer Car Installation at Lorain, Ohio



sign of skip hoists, transfer cars and bins, but in essence and principle the Lorain and Eliza plants embodied all that is found in the most modern equipment. The only radical departure has been in the method of handling coke, whereby the coke is delivered direct by gravity into the skip cars instead of into the transfer car and thence into the skip cars.

In 1898 it was also the privilege of the writer to design a furnace plant and equipment for the Lebanon furnaces at Lebanon, Pa. The stock handling equipment in this instance is unique and is rendered possible by the use of only one ore, Cornwall. The double skip hoist lies at a relatively flat angle and at ground level passes under a large rectangular bin divided into compartments for coke, ore and limestone. Spouts with gate control lead from the compartments to the skip cars, thus enabling the delivery of materials direct from the bins to the skip without the intervention of the usual transfer car. A scale platform designed to receive the skip is located at the bottom

Fig. 3—General Arrangement of the Double Skip Hoist and Power Transfer Weigh Car at the Eliza Furnaces of the Jones & Laughlin Steel Company

of each skip track and provides the means for the weighing of materials. The operation of the bin gates is controlled from one point. This furnace went into blast November 1, 1899. It is evident that this type of equipment reduces the cost of delivering materials into the furnace to a minimum. It is believed that the arrangement described above is the only one of its kind in existence, and it is interesting to know that it is in use to-day.

FOR A 40-CENT IRON-ORE RATE

Independent Companies' Case Against Steel Corporation Roads

WASHINGTON, D. C., January 19, 1915.—The Interstate Commerce Commission in the past week has heard the final argument on the Minnesota iron-ore case and a decision will be given in time to permit the framing of freight tariffs before the opening of navigation. The main question involved in this interesting controversy is what, in view of the evidence, is a fair and reasonable rate for transporting a ton of iron ore from the mines in the Mesaba and Vermillion ranges to the loading docks at Superior, Duluth and Two Harbors. Up to November, 1911, this rate was 80 cents per ton, but on that date all the carriers made a voluntary reduction to 60 cents. The independent manufacturers insist that 40 cents would be a highly remunerative rate and that the present rate results in an enormous profit to the United States Steel Corporation, the owner of two of the ore carrying roads, a profit so large that for every ton of independent ore handled it enables the corporation to transport "1116 tons of corporation ore free of cost to the corporation as the owner of the railroads by reason of the excessive rate on iron ore shipped by independents."

HEAVY INVESTMENT, BUT ORE WILL RUN OUT

In arguing for the maintenance of the existing 60-cent rate, counsel for the carriers contended that the peculiar character of the roads themselves has a vital bearing upon the situation. Almost the entire traffic is ore, the non-ore business being only about 10 per cent. of the total. The roads, therefore, it was declared, were subject to the ups and downs of a particular industry. Also the transporting of ore required exclusive construction and equipment, special types of cars and engines, heavier rails and stronger bridges than ordinary. Further, the ore traffic is limited to the season of navigation and for more than a third of the year an enormous investment lies idle. Still more burdensome, counsel declared, was the fluctuation of the tonnage from year to year. The Iron Range road, for example, carried only 5,700,000 tons in 1908, over 10,000,000 tons in 1913, and less than 6,000,000 tons in 1914. The Duluth, Missabe & Northern carried about 13,600,000 tons in 1910 and about 6,000,000 tons in 1914. Yet the roads must be constructed and equipped for the "peak load."

The ore traffic, counsel contended, is by nature a steadily diminishing quantity, every ton of ore carried reducing by that precise amount the future traffic of the road. Ordinarily the traffic which a railroad handles is a correct index of the progressive development of the country through which it goes and the greater the traffic the brighter the prospects for future business. Exactly the contrary, counsel insisted, is true of the ore carriers.

Counsel representing the independent iron and steel manufacturers, including the Cambria, Republic, Youngstown Sheet & Tube, Brier Hill, Andrews & Hitchcock, and the Jones & Laughlin Steel companies, sharply challenged the statements made on behalf of the carriers, declaring not only that the ore rates were much too high *per se*, but that to the extent that they were unreasonable the Steel Corporation received an undue preference over its competitors through its ownership of the carriers. Taking up the case of the Duluth & Iron Range Railroad, counsel declared that it was shown by uncontradicted evidence that that road

was not originally built to haul ore from the Mesaba range, but was constructed from Two Harbors to Tower in 1884 and extended to Ely in 1886, and that the ore on the Mesaba range, not being discovered until five or six years after the road was built to Ely, came as wholly new business to this road through the construction of the line westerly from Allen Junction, which did not exceed 35 to 40 miles in length. It was further contended that there were great and increasing probabilities of traffic to the two roads outside of the carriage of ore and so far as possible future exhaustion of the ore produced is concerned, it was contended that this was so far distant as to leave no ground for apprehension and to justify no calculations of freight charges based thereon.

Considerable attention was given by counsel for the independents to the contention by the carriers that there is an important difference in the way mining operations are carried on by the Steel Corporation and the independents as to the sorting of ore, etc.; but it was declared that whatever this difference may be it is negligible and does not characterize the business as a whole. If there is any difference, the ore of the corporation in some instances has to be hauled more miles than ore shipped from any of the independent mines. It was admitted that in the case of one shipper, some extra handling, mixing or switching at the docks was required, but it could not fairly be said that any sort of conduct on the part of this single shipper should be atoned for by penalties assessed upon the other independents.

Elaborate figures were produced by counsel for the independent manufacturers to show that a 40-cent rate would provide a handsome return on the highest estimated valuation of the Duluth & Iron Range road of \$33,180,000, while the cost of reproducing the road would not exceed \$16,575,000, and an even lower rate, it was contended, would provide an equally remunerative return for the Duluth, Missabe & Northern road as well as for the Great Northern. W. L. C.

World's Output of Ammonium Sulphate

The world's production of sulphate of ammonia in 1913 exceeded all previous records. Reckoning all forms of sulphate, the output is estimated at 1,409,223 metric tons in 1913, an increase of 145,883 tons over 1912, according to a pamphlet issued by the American Coal Products Company, 17 Battery place, New York. Germany, the largest producer, contributed 548,558 tons of this total; England was next with 439,565 tons, and the United States third with 176,900 tons, France and Belgium ranking next.

About one-third of the world's ammonia output comes from illuminating gas manufacture, while the remaining two-thirds comes mainly from by-product coke ovens operated in connection with iron and steel plants. Of Germany's total production in 1913 of 548,558 metric tons, 475,558 tons or 86.7 per cent. came from coke ovens. In England 133,816 tons of a total of 432,618 tons came from coke ovens, or only 30.9 per cent. In the United States about 78.5 per cent. of the ammonium sulphate produced came from coke ovens. Several years are likely to elapse before the record production of 1913 will be equaled and before Germany will again hold first rank.

The blow from a swinging crane hook in a steel plant recently smashed the safety glasses worn by one of the workmen, and the force of the blow was great enough to stun the man, but none of the glass entered his eye. The goggles had a safety flange extending over the back of the glass which served to prevent fragments of glass from loosening and injuring the eye.

The Atlas Car & Mfg. Company, Cleveland, Ohio, has received good orders for mining cars for South America. This class of equipment has heretofore been purchased almost wholly from European countries, but the war has resulted in turning this business to American manufacturers. The company also reports a fair volume of business in lime kilns and hydrators.

MANGANESE ORE NOT MOVING

COURTESY IN BUSINESS OFFICES

British and American Imports Negligible—
Europe's Consumption

Manganese ore imports to the United States as well as to Great Britain fell off to practically nothing in November. In October imports to this country were 39,836 gross tons, against 30,084 tons in October, 1913. In November they dropped to 1761 tons against 16,159 tons in November, 1913. Great Britain's importations have been constantly lessening for some months. They were 38,210 tons in October but only 1230 tons in November.

The effect of the war has been to lessen greatly the amount of manganese available in the steel-producing countries.

Germany ordinarily draws most of its supply of ore from Russia, which is now sending out nothing from the Caucasus. While the production of steel in both Germany and Austria is far below normal, immense supplies are being needed for military purposes. Belgium has ceased to make steel. France produces about 6000 to 7000 tons of manganese ore, importing about 100,000 tons yearly, but its steel manufacturing is practically suspended. Great Britain's imports amounted to 601,170 tons in 1913 as against 387,730 tons in 1912; 358,910 tons in 1911; 482,200 tons in 1910 and 330,500 tons in 1909.

The steel production for 1913 of the leading countries of the world together with the amount of manganese ore required to furnish ferromanganese to make this steel, is shown in a table published by the London Iron and Coal Trades Review:

Countries	Steel, tons	Manganese ore, tons
United States	31,300,874	775,000*
Germany	18,949,929	473,748
Great Britain	7,665,876	191,597
France	4,419,241	110,481
Austria-Hungary	2,682,619	67,065
Belgium	2,000,000*	50,000*
Russia	4,503,599	112,590
	71,520,138	1,780,481

*Estimated.

Germany produced about 85,000 tons of the ore for her own use in 1913, the balance of nearly 390,000 tons coming from India, Russia and Brazil. The above figures do not give the actual amounts of ore consumed as ore in each country, because Germany made not only all it used but exported ferromanganese from imported ores. England consumed more ore to make ferromanganese for export than for home consumption. Austria, Russia and France made their own ferromanganese. The United States produces about 50 per cent. of the alloy it consumes.

WORLD'S OUTPUT OF MANGANESE ORE

The total world production of manganese ore ranges from 2,000,000 to 2,250,000 tons a year, of which about 49 per cent. comes from Russia. The output is distributed as follows, according to the most recent figures, these being chiefly for 1913:

Tons	Tons
Russia	987,724
India	674,315
Brazil	163,506
Germany	75,787
Austria	17,717
Spain	16,678
Turkey	14,123
Japan	10,955
Greece	10,581
Hungary	10,410

Portsmouth Steel Company Addition

The Portsmouth Steel Company, Portsmouth, Ohio, has completed its new finishing department addition and the necessary equipment has been installed. It is reported that the company is having plans prepared for an addition to its main plant.

Because of their growing trade with South America, manufacturers at Racine, Wis., have engaged correspondents and stenographers familiar with the Spanish language. A course in Spanish is to be instituted in the high school and vocational schools of the city.

Some Observations from the Standpoint of the
Salesman

Much has been written about business courtesy, and in the iron and steel trades salesmen have quite well learned the varying characteristics of important buyers in this respect. Some proprietors and purchasing agents have reputations which are not calculated to help their companies when those who ordinarily solicit their trade happen to be in the market, in turn, for what these exponents of brusqueness in business relations have to sell. The subject was discussed by John C. Jay, Jr., general manager of sales of the Pennsylvania Steel Company, in a recent issue of that company's *Frog Shop Digest*, and the writer puts very aptly some considerations that too often are forgotten. Below are extracts from the article:

"We go to see Smith in his house, and are ushered into the parlor, while Smith in his office permits us to warm a bench, if he has happened to think long enough to provide one. A wooden barrier with swinging gate, securely locked by mystic mechanism, keeps us in our proper place, while the youth within fingers our pasteboard with grimy thumb and asks us the nature of our business. The fact that our business with Smith may be of his own seeking, or the fact that we may be doing Smith a favor by our call, as a rule, causes no discrimination. Smith, utterly unconscious, sits serene, far removed from the common rabble, behind a door, the heavy letters on which proclaim he must be 'private.'

"Our imaginary Smith is, I think, fairly typical. There is not a salesman who reads this article who does not number many Smiths among his acquaintances. Yet, strangely enough, Smith himself when finally reached is very human. He has the ordinary manners and the ordinary standards of the average man. He would probably be very much astonished if he knew the small tumult of anger he has unconsciously caused in our mind as we approach him. . . . Through every intelligent means at its command, the company has made an effort to make itself known, to welcome custom, yet the first impression anyone entering its door receives is that entrance cannot be gained without proper credentials. For the sake of teaching the life insurance agent his place, of repelling peddlers and stopping the occasional deadbeat, an elaborate system is erected, that for stupidity cannot be matched, for while seldom excluding the really clever rascal, the self-respecting man on legitimate business bent is insulted and annoyed, and not infrequently excluded.

" . . . We have been criticizing Smith because we feel he has not been running his business and reception room quite to suit our natures, possibly over-sensitive. Today, however, Smith is a buyer, and with the sense of importance which always goes with ability to purchase, he has called upon us to see what trade he can make to mutual advantage. So that today the shoe is on the other foot, and Smith has come to us instead of our having to go to Smith. I wonder if our sales offices and salesmen have ever stopped to study just the mental process which our good friend Smith goes through under these reverse conditions. In other words, does Smith find our own office intelligently manned at the entrance, and is he made to feel that he is welcome, and that of all places our office is the one where he will be intelligently served? . . .

"Let us reform our good friend Smith without his knowledge, for that is tact, and tact is salesmanship. By all means keep our own doors wide open. The open door spells welcome and dispels distrust. If we are tied up and busy (and even a salesman is busy and tied up at times), our visitor is entitled to know it promptly, for perhaps his business is quite as urgent and his time quite as limited. Let us dust and polish and furbish, that Smith may find pride of good house-keeping in our offices as well as our homes. Let us relegate the barrier gate and the truculent greeting to the period, long past, when flaunting suspenders and hatted head were badges of force-draught office activity."

INDUSTRIAL LEADERSHIP*

The Manager of a Business Not Solely a Ruler of Matter and Force

BY H. L. GANTT

The importance of leadership has been given all too little attention in the past, apparently for the reason that accidental conditions have been in many cases quite as effective in securing wealth as leadership. Such opportunities, however, are no longer numerous, especially in our industries, and a study of industrial leadership is forcing itself upon us.

Leadership, in both war and industry, is not only based on the same principles, but is equally important. Just as war is the great training school for those who are to make war, so industry is the great training school for those who are to create industry. Leaders in war and in industry hold the same relative importance in their respective spheres. If this is the case, it is well for us to see what the greatest warrior of modern times has to say about the importance of leadership in war, and thus arrive at some appreciation of the importance of leadership in industry. Napoleon said:

In war men are nothing; it is the man who is everything. The general is the head, the whole of an army. It was not the Roman army that conquered Gaul, but Caesar; it was not the Carthaginian army that made Rome tremble in her gates, but Hannibal; it was not the Macedonian army that reached the Indus, but Alexander; it was not the French army that carried the war to the Weser and the Inn, but Turenne; it was not the Prussian army which, for seven years, defended Prussia against the three greatest powers of Europe, but Frederick the Great.

The historian in making this quotation stated that Napoleon reiterated a truth confirmed by the experience of successive ages, that a wise direction is of more avail than overwhelming numbers, sound strategy than the most perfect armament. Similarly in industry—a wise policy is of more avail than a large plant; good management, than perfect equipment.

These facts in military history have their exact counterpart in industrialism, and the real problem of to-day is how to select and train, or rather how to train and select our industrial leaders.

AUTOCRATIC RULE IN INDUSTRY

Possession of wealth, and hence power, does not necessarily fit a man for leadership. There is a general feeling, however, that because our industries have in the past been directed in an autocratic manner, autocracy will continue to be the rule and that there is apparently no escape from it. This feeling seems to be quite widespread and to be substantiated by the marvelous industrial development of Germany under autocratic rule. While it is possible that autocracy in industry is the final stage, I do not think the case is by any means proved. Has not the development of industrial organization been in a large measure parallel to the development of political organization? In both, we had individualism; then paternalism; and then tribalism, or something approximating it; next we had autocracy. In our political organization we have passed one step beyond—we, in this country, believe in democracy, and the great struggle now going on in Europe is largely a question as to whether democracy or autocracy shall be the final phase in the old world.

The marvelous efficiency of Germany as an industrial and military nation has claimed the attention of the whole world; but we must realize that Germany is the only nation which has made any serious at-

tempt at national organization of industry. When, therefore, we compare the industrial organization of Germany with the industrial conditions of any other country, we are not comparing one organization with another, but a highly perfected organization with lack of organization.

In the summer of 1913, 300 members of the American Society of Mechanical Engineers visited Germany at the invitation of the Verein Deutscher Ingenieure. We spent three weeks touring the country and visited most of their great cities, where we were entertained with the greatest possible hospitality and had thrown open to us many of their most successful industrial plants. We were much impressed with what we saw, and the universal prevalence of system and order elicited our unbounded admiration. When, however, we came to the consideration of the industrial plants as units, we were almost in entire accord that, with the exception of a few industries, plant for plant, America had nothing to fear from Germany.

INDUSTRY UNDER DEMOCRATIC CONDITIONS

This leads us, therefore, to ask if autocracy in industry is not just as much a phase in industrial development, as we, in this country, consider it to be in political development. As a matter of fact, during the past ten years it has been my effort to introduce methods of equal opportunity into industry and to select leaders in the most democratic manner possible. I am pleased to say that the efficiency of the organization thus produced has seemed to be almost in direct proportion to the success in introducing democratic methods of selecting leaders.

Too little work has been done in this line, and there are too few results available to make any very strong statements, but the success so far attained is such as to make us feel that we are on the right track, and that the nation which first does away with autocracy and special privilege will take the lead in industrialism. The scientific method thrives best under democratic conditions, and our chance of getting proper industrial leaders is far greater when we have a whole people to choose from than if they are to be selected from any class.

Emphasis that in all problems of administration the most important element is the human element compels acceptance of the democratic idea, for no manager can to-day attain the highest ideals unless he is thoroughly familiar with all the elements with which he has to deal. It is general experience that unless men are studied from a democratic standpoint the student fails to get a proper appreciation of the human element.

That teachers of economics and business administration should regard the business leader as not only a ruler of matter and force but as a leader of men is exactly right. The attempt in the classroom to show results which have been obtained is all right, if these results illustrate a general principle; but if the methods used have no underlying principle to connect them, they may result in convincing the student that a system of management is simply a series of isolated "stunts."

This kind of teaching in college and out, is, in a measure, responsible for the great army of men who call themselves efficiency engineers, many of whom are not engineers at all, but simply stunt peddlers. Nevertheless they are doing some good, for the man who to-day buys a few valuable stunts, at least learns that he does not possess all available knowledge and may be led some day to apply the scientific method. Colleges should not cater to such a class, which is already large enough, but should prepare students to grapple with the basic indus-

*From a discussion of a paper read before the American Economic Association, December 30, 1914. Mr. Gantt is a consulting engineer, New York.

trial problem, namely, that of becoming so grounded in the principles of administration which they can only do in industry itself, that they may become the real industrial leaders of the future.

In conclusion, I might add there is another similarity between war and industry in the manner in which those responsible for success are most often hampered. Just as in war nobody denies that the military arm must be subordinate to the aims of diplomacy, so in industry the factory manager must serve the needs of the financier; but in war, it is a great mistake for the diplomat to undertake the control of the armies in the field, so in industry it often produces most detrimental results when the financier undertakes to usurp the duties of the manager. It is my belief that much of our inefficiency, and many of our most serious industrial troubles are due to this very thing.

It is a well-known fact that men who have power feel too frequently that they should themselves exercise it, not recognizing their lack of knowledge. We should, however, not be too critical of such people, for it took a man as great as Abraham Lincoln nearly three years to realize that a trained soldier could handle the armies of the United States more effectively than he could.

Customs Decisions

BREWING-MACHINE PARTS

The Board of United States General Appraisers has disposed of a controversy between the Government and R. F. Lang, New York, by holding that finished parts of brewing machines imported under the tariff act of 1909 are not to be regarded as in the general class of metal manufactures provided for in paragraph 199, at 45 per cent. The importer claimed that the articles are properly dutiable at 1c. per lb. under paragraph 147, specifying "castings of iron or cast-iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles." The importer cites a decision of the Customs Court of Appeals which he contended is applicable to the merchandise in question in this importation. The board agreed and sustained the protest, the collector's classification being reversed. Similar importations under the act of 1913 will, it is expected, be assessed in harmony with the board's decision.

WIRE STAPLES

The B. F. Goodrich Company, Akron, Ohio, was sustained in a contention involving the construction to be given the provisions in the tariff act of 1913 referring to staples. The merchandise in dispute before the board was invoiced as staples, and consisted of articles made of wire bent into the form of a U. They are used to anchor cords while these are being knitted into form for use in making automobile tires. In making his return, the appraiser taxed the goods 15 per cent. under paragraph 114, as "wire staples, manufactures of wire." The collector took duty accordingly. The importer alleged that the merchandise is free of duty under the provisions of paragraph 554, mentioning "wire staples." The board sustained the protest, but upon request of the Department of Justice, the case was reopened and a rehearing granted, at which the Government sought to prove by trade testimony that there was but one general class of wire staples, to wit, that which embraced articles made or formed from pieces of wire shaped in form of a U, with sharpened points. Frank S. Haggerty, the sole witness for the Government, testified that he is employed by the American Steel & Wire Company; that he had sold fence staples, double-pointed staples, etc., and that he was familiar with the merchandise which is known and recognized in the trade and commerce of this country under the name of staples, and that the only articles that would be embraced under that term would be those which are made or formed into pieces of wire in the

form of a U, with sharpened points. He further testified that this was the only type of staple he knew of or had ever handled. As this was all the evidence the Government was able to submit, Judge Fischer says such testimony is insufficient to prove commercial designation. The board, therefore, has recourse to the dictionary definitions of the term. From these descriptions, the board holds it apparent that there are several different kinds of staples, and that the testimony of the Government's witness would indicate that he has knowledge only with respect to the single variety of wire staples in which he deals. The board finds that there are at least five separate classes of staples defined in the dictionaries, one of them being the U-shaped kind such as figures in the controversy. Under these circumstances, the board is satisfied that the merchandise involved in the present case belongs to the general class of wire staples to which free entry is accorded under paragraph 554. The collector is reversed.

PRINTING-PRESS PARTS

J. Spiero & Co., New York, protested the collector's classification of cast-iron repair or replace parts of Victoria printing presses. It was shown that they require fitting before they can be incorporated in the machines, and that they are partly rough and partly machined. The collector returned the articles at 45 per cent. as manufactures of metal under paragraph 199 of the act of 1909, whereas the importer claimed them to be advanced castings carrying a customs tax of 1c. per lb. under paragraph 147. The board upholds the importer and reverses the custom house assessment.

NIPPERS AND PLIERS

The Frank S. Betz Company and V. Mueller & Co., Chicago, lost in claims dealing with the rate of duty on forceps, clamps, needle-holders, tonsil-schnurers, tonsil-clamps, zangen and rongeur. Duty was levied at 30 per cent. under the provision for "nippers and pliers of all kinds, wholly or partly manufactured" contained in paragraph 166 of the tariff act of 1913. They were claimed properly dutiable at 20 per cent. under paragraph 167, as manufactures of metal not specially provided for. In overruling the protests, Judge Fischer says it must be presumed that in enacting the present tariff law Congress intended that blacksmiths' tongs, surgical instruments and dental instruments or parts thereof, which were specially exempted from the provisions of the corresponding paragraph in the act of 1909, should now fall into and become properly dutiable under the general provision in paragraph 166 for "nippers and pliers of all kinds, wholly or partly manufactured."

IMPORTS IN AMERICAN VESSELS

It is announced at the New York offices of the Board of General Appraisers that a large number of importers of metal goods, while making claims for the 5 per cent. rebate allowed under paragraph J, subsection 7, of section 4, of the act of 1913, when merchandise is imported in vessels of American registry, fail to substantiate their claims with proper evidence. In fact, it is stated, a good many protests merely make the claim for the discount without even mentioning the vessel's name. The validity of the 5 per cent. clause of the present law is now before the United States Court of Customs Appeals for decision, and, as the question at issue involves treaty obligations, is to go eventually to the Supreme Court for final adjudication. The General Board is anxious to remind importers that if the validity of the provision in question is ultimately upheld, importers cannot avail themselves of the heavy refunds that would have to be paid out by the Government, unless protests filed in the first instance with the board contain convincing evidence as to the identity of the vessel in which the merchandise is transported. This applies also to goods imported in ships of foreign registry, since the test case about to be decided by the Customs Court has incorporated the contentions of 25 nations having commercial treaties with the United States, all of which assert that if the tariff's provision is to be given effect to American vessels the same treatment must be accorded merchandise entered in vessels of the foreign nations concerned.

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Our Half-Yearly Index

The Index of *The Iron Age* for the past half year, July to December, inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who desire copies will be furnished them on application.

The Foreign Trade Convention

That the movement for the extension of American export trade is national is emphasized by the taking of the second convention held under the direction of the National Foreign Trade Council to a Western city. At St. Louis this week the manufacturing, commercial and banking interests of the whole country are strongly represented, whereas New York and other Eastern cities contributed most of the attendance at the first convention held in Washington last year. While it is not a key note, the desirability of enlisting smaller manufacturers in the export movement is given special prominence in the St. Louis programme. We have formed the habit of thinking that an export trade can only be ventured upon by the largest interests, and there may be some surprise that the great companies whose leading men make up the National Foreign Trade Council should exert themselves to help smaller manufacturers to a footing in foreign markets. But on second thought there is no altruism about it. Exports beget more exports. In the long run the sections of the country must move together in a matter which so greatly concerns our national development. Legislators do not always recognize it, but the truth is that whatever helps or hinders one interest or one section must affect other interests and other sections. Those who have pioneered in opening up foreign markets are fully persuaded that every activity set in motion to get other home manufacturers into the export trade will be of help to them.

The character of the papers prepared for the St. Louis convention indicates that nearly six months' study of the great questions which the war has brought up to our business men for solution has done much to clear up the general thinking. The discussions of ways and means to increase export trade have long been vague. They have seemed to deal with something far away. The strong educational campaign of the past half year has added tremendously to the equipment of American manufacturers for their new work. It is perfectly evi-

dent that after years of talking about foreign trade they are now actually dealing with ways and means of getting it.

Copper Statistics Discontinued

Announcement was made last week that at a meeting of the members of the Copper Producers' Association it was voted to dissolve the organization and make no more monthly reports of production and stocks. The publication of these reports, which had been conducted since January, 1909, was suspended last year at the outbreak of the European war.

While the war, with its demoralization of all business, was responsible for the discontinuance of the reports, it appears likely that such action would inevitably have been taken in the course of time. A considerable number of the members have never been warmly in favor of giving to the public information which they considered a trade secret. They yielded to the opinions of other producers who believed that the general interests of the trade, both producing and consuming, would be improved by greater publicity. It was argued that the progress of the times was in the direction of spreading wider knowledge of all commercial conditions. It was assumed that the producers themselves would derive benefit by accurate knowledge of stocks of copper as held by their competitors and themselves.

As the months passed by, however, it came to be believed by an increasing number of producers that the statistics of production and stocks were being used by consumers to the detriment of the producers. It has been asserted that whenever the monthly statement showed an increase in stocks the consumers refrained from buying in the belief that prices would have to give way under the increasing load of unsold copper. On the other hand, when stocks were shown to have decreased the same consumers would either question the truthfulness of the figures or refer to the statistics of production and deduce inferences that the rate of output was so large that it must ultimately exceed consumption and that this again would cause prices to decline.

It is not surprising that the producers should now come to the conclusion to publish no more monthly statistics of production and stocks. This action is to be regretted, as it is not only a retrogression from the growing tendency to greater publicity regarding commercial affairs, but as it relegates the copper trade to the former conditions of uncertainty and speculation. With no accurate

knowledge regarding production or stocks, the trade, with the exception of probably a few large producers, will hereafter be wholly at sea regarding a basis on which to conduct operations. Rumors are likely to be circulated regarding paucity of stocks, and prices may then be run up to high figures, with a subsequent collapse and considerable loss to those who were drawn into purchasing. It may also be assumed that consumers who would ordinarily be well guarded by carrying good stocks may rest in fancied security with only moderate purchases, and a scarcity of supplies develop which would cause them to scramble for copper and greatly advance the price on themselves. Looking back over the past six years, the producers of copper may well ask themselves if their interests have not been better served by the prevalence of moderate prices and reasonable profits, with a heavy general consumption of copper, than if prices had so widely fluctuated as to be at times so high as to cause the general substitution of cheaper metals.

The Machinery Trade and the Railroads

Builders of machine tools and kindred equipment and machinery dealers are watching sharply for results from the recent freight rate increase. Every one familiar with progressive railroad management realizes that repair facilities, taking the country as a whole, are not at all good, in fact are in many cases so very bad as to be a source of extravagance. Until quite recent years this department was neglected by managers. On the top of the condition thus created came the radical change in machine shop practice due to high speed steels, so that many of the railroad shops dropped still farther in the standard of equipment and methods, though no branch of industry can use the improved practice to better advantage. Then came refinements of practice, such as the introduction of grinding machines by means of which locomotives and car wheels and their axles are made truly round and concentric. Even the railroad shops which were considered most modern a generation ago have come to be obsolete to a greater or less degree. In recent years the railroads have not had the money to devote to a correction of these conditions. A few splendidly efficient shops have been created but they are the exception.

Railroad managements know what they should have in order to keep their rolling stock up to the required degree of efficiency. But they have been helpless, because requisitions for new equipment and recommendations for new shops either have been set aside or when passed upon favorably have at length been dropped. The purchasing agents of American railroads have on their files approved requisitions for millions of dollars worth of machinery. The present question is how rapidly machinery to meet these needs will be absorbed. Already some awakening has been indicated, and the machinery manufacturers believe the demand will increase consistently and solidly, though probably slowly. The railroads have other things to purchase—rolling stock, rails, structural steel. They have been hard hit by the depression. From now on, however, their incomes will grow, not only because they will receive higher rates for their

freight, and in many cases, for their passengers, but also because they will carry more freight. And one after another requisitions already favorably passed upon, and new ones, will become orders and manufacturers who build metal-cutting tools should share in a substantial way in the enlarged demand.

A Stand Against Limitation of Output

The formation of the American Erectors' Association by western Pennsylvania and eastern Ohio companies engaged in structural and plate work has been forced by the steadily growing exactions of labor unions. The organized boilermakers, riveters, helpers and caulkers have set a fixed number of rivets as a day's work and in tank construction have exacted 75 cents a day extra on all work over 35 feet high. Competition in every form of steel structural work has been severe in the past two years and employers have never needed more vigilantly to apply methods which would increase production and reduce unit cost. The arbitrary limitation of a day's work, indefensible under ordinary conditions, is the height of folly on the part of the union at a time when every tendency in industry is toward increasing rather than limiting production, and when the number of men is far greater than the number of jobs.

Labor conditions in the industry referred to have been growing more and more burdensome and the decision of the firms in the new association of employers to insist on the open shop is like the turning of men with their backs to the wall to fight for their place in business. There is no purpose of discriminating against union men, but if the unions insist on the control of the shop, leaving to the employers little beyond bringing in work and finding money for payrolls, a struggle will ensue, of which the end is quite sure to be the defeat of another attempt by non-progressive unionism to fix the day's work by decree.

Our Expanding Foreign Trade

Despite the complaint of a scarcity of vessels in the ocean-carrying trade, figures just made public by the Department of Commerce show that our exports of merchandise in December almost made a new record. They reached the great total of \$246,266,047, against \$205,378,333 in November and falling only \$4,049,760 short of the high record made in December, 1912. The imports for December totaled only \$114,402,970, against \$126,467,062 in November and were \$69,622,601 less than in December, 1913. The excess of exports over imports for December was \$131,863,077, against an excess of \$79,411,271 in November and an import balance of \$19,400,406 in August. This great improvement in our foreign trade bids fair to continue, as exports of merchandise are keeping up well, while our imports are still checked by the war conditions in the great manufacturing countries of Europe. It is interesting in this connection to note the improvement in our financial standing in foreign markets. The credit of the United States is so high that in some countries our dollar is quoted at a premium of five per cent.

The New Pennsylvania Rail Specification

It is understood that an agreement has been reached by the Pennsylvania Railroad Company and several rail manufacturers as to the price at which rails will be furnished under the specifications the railroad company has prepared as the basis of its purchases for this year. The new provision that the bloom be allowed to cool to atmospheric temperature before further operations is less troublesome to some mills than others, since reheating has been the practice of a number of manufacturers in the past year or two. The great expense in connection with the Pennsylvania Railroad specification is that involved in the requirements inserted for the elimination of segregation troubles. These call for the taking of drillings in the upper part of the head and at the junction of the head and the web and require that the variation in carbon in such drillings shall not be more than 12 per cent. For the prevention of segregation some mills will be forced to heavy cropping, which is apparently the thing aimed at by the requirement. The price of the new rail will probably be not far from \$34.

CORRESPONDENCE

Price Diagrams

To the Editor:—In *The Iron Age* of December 17 you published a book review of my book "Graphic Methods for Presenting Facts." The reviewer refers to a cut taken from *The Iron Age* which I severely criticized on page 110 and states that "in some cases, however, it is possible that Mr. Brinton has not quite grasped all of the limitations confronting the author of the diagram which he criticises." The reviewer apparently believes that this particular diagram could not have been made to extend to the zero line of the vertical scale without a prohibitive engraving bill and an increase in the amount of space taken in the paper, where space is valuable.

The diagram in question, as published in *The Iron Age*, was unnecessarily misleading to readers of the paper because the bottom line of the chart was not at zero of the vertical scale. Even though the diagram was intended to show primarily the fact that the prices of cast-iron pipe were almost a constant above the price of pig iron, it would still have been far better to have arranged the chart so that the bottom line would have been at the zero of the vertical scale. If the base of the chart had been at the zero of the vertical scale, the reader would have obtained instantly a correct idea of the fluctuations in the price of pig iron and he would have noticed at the same time that the cast-iron pipe prices were at practically a uniform distance above the price of pig iron. As the diagram was shown in *The Iron Age* a rapid reader might have been led to believe that pig-iron prices had increased about 1000 per cent. from 1904 to 1907, when as a matter of fact they but doubled in that period of time.

There is another error in interpretation which could easily be made from the chart as published in *The Iron Age*. The general appearance of the chart would indicate that the prices of cast-iron pipe are more than double the average cost of pig iron. It is only by detail study of the chart that the reader notices that the prices of cast-iron pipe are only about one-third higher than the cost of pig iron.

There is no difficulty whatever in drawing a chart from these same data so as to make the zero line at the base of the chart and yet having the chart so it can be printed in exactly the same space as the chart which was shown in *The Iron Age*. Comparatively few magazine editors seem to realize that one of the most important things in chart making is to determine at the beginning the space which the chart is to occupy and then to have the chart drawn so that it will occupy that space and yet be correct and clear in every detail. This chart could have been made correctly, and at the

same time made so that it would fit the space which was actually taken in the magazine, yet with absolutely no increase in the engraving bill and with no additional paper required for printing.

If the reviewer had read my book carefully, he would have noticed at numerous places in the book the suggestion that if for any reason there is not enough space available to show the zero line at the bottom of the chart, then it is well to use a wavy line at the bottom of the illustration to indicate that the bottom of the chart has been omitted and thus warning the reader to interpret the chart from the figures in the vertical scale instead of visually comparing the vertical distances from the bottom of the illustration to different parts of the curve shown in the chart. This point was brought out especially on pages 350 and 352 and also in rule 15 on page 362.

WILLARD C. BRINTON.

New York, January 12, 1915.

An American Abroad on the Handicap of Laws Against Cooperation

To the Editor: "Capture Germany's lost trade" before the "keen AMERICANS" get it is the British shibboleth at present. Every one is alert to see British trade expand and encompass the earth. They are fully alive to the possibilities of the markets hitherto controlled by Germany and are elaborately preparing to meet the situation. Several important trade associations have recently been launched, the sole purpose of which is to promote the sale of "Made in ENGLAND" goods. And to this end the British Government, to its credit be it said, gives its cordial and helpful support.

If a group of our manufacturers in the United States were similarly to combine for profitably promoting the expansion of our foreign business, they would be indicted for violating the Sherman anti-trust law. They must, therefore, not only individually compete with the world but with one another as well. Is it any wonder that there are so many depressed industries in the United States? In every other country of consequence legislative interference with business organization except in a regulative way as against restraint of trade is tabooed. Why should the United States be the exception? We Americans no less require protection from unqualified and mischievous competition, and such protection is only to be obtained through trade organizations, by "regulation not prohibition."

Recent timely articles on anti-trust law restrictions, emanating from New York, attract attention here, for the British are not worrying about any competition except American competition, and they will not long worry about us when they fully comprehend the anti-trust law handicaps of our manufacturers.

Germany's admirable laws for the regulation and encouragement of organized competition have been the means by which in a brief period of time its commerce and industry reached a high development and immense proportions. At this important juncture in the world's affairs, if the United States would adopt Germany's able system for the regulation of trade organizations, and substitute it for our prohibitive anti-trust laws, our American industries in all lines would immediately resume their former activity and prosperity.

The time has come, it seems to me, when Americans should set out to transform our long continued government policy of oppression and antagonism toward business to one of peace and good will and of help and encouragement. Our American slogan should be, "Regulation not prohibition of business co-operation."

JOHN H. PARKS.

London, England, December 31, 1914.

The Pittsburgh Iron & Steel Foundries Company, Midland, Pa., is distributing a framed office motto, "It Can Be Done." Referring to the legend the company says that it is designed to mold public opinion as to the present and future possibilities of business and adds: "The captains of industry must put their shoulders to the wheel and by every possible means must help to get prosperity's wagon out of the mire of dull times."

For the Reorganization of the Interstate Commerce Commission

WASHINGTON, D. C., January 19, 1915.—The complete reorganization of the Interstate Commerce Commission, with a view to its enlargement and the discharge of its functions in a prompt and business-like manner, is provided for in a bill which has just been introduced by Senator Pomerene of Ohio, a leading member of the Committee on Interstate Commerce. The bill is drawn in the form of amendments to sections 17, 20 and 24 of the interstate commerce law which are designed, first, to enlarge the commission from seven to nine members; second, to provide sub-divisions, authorized to carry on simultaneously the various branches of the work delegated by the interstate commerce law, and, third, to provide a method of advising the public with regard to the actual financial condition of the carriers and the value of their securities. The sub-boards are to be of not more than five members each. It is provided that the commission may order that any of its work, arising under any of the provisions of the interstate commerce law or the numerous acts amendatory thereof, "may be assigned or referred to any of the said divisions for action thereon."

A conservative substitute for the provisions of the Rayburn bill is incorporated by Senator Pomerene as an amendment to section 20 of the interstate commerce law. In lieu of authorizing the commission to supervise issues of railroad securities the Pomerene bill, proceeding upon the assumption that the object of such supervision is the protection of investors, prescribes a system of publicity, which is described in the amendment. Further amendments to section 20 give the commission the right at any time to examine all correspondence, documents, papers, etc., relating to transactions of the carriers, or of any officer, director, stockholder, agent, attorney, or employee thereof or of "any person, natural or artificial, acting or having acted for said carrier, or in the promotion or financing of said carrier, or as construction or holding company, fiscal agent, or other intermediary for or with said carrier."

Senator Pomerene's bill has been referred to the Committee on Interstate Commerce and its author will endeavor to secure a favorable report upon it at the present session. Whether action is taken or not, the measure will receive very serious consideration at both ends of the Capitol and will furnish a basis for the legislation reorganizing the commission and increasing its efficiency which it is confidently believed will be enacted by Congress in the very near future.

W. L. C.

International Steam Pump Company's Affairs

Despite the handicap of receivership and impending reorganization, the International Steam Pump Company has been making a fairly creditable showing of earnings and has been strengthening its financial position very decidedly, says the Wall Street Journal. When the company went into receivers' hands last August there was outstanding \$1,150,000 of short time paper due in October. The receivers have wiped out the entire amount of this floating debt—a most important betterment considering the fact that it was this floating debt that furnished the hinge upon which the receivership turned.

Reorganization is being delayed by reason of the difficulty of coming to an understanding with the minority preferred stockholders of the Blake & Knowles Steam Pump Company. The reorganization will radically alter the present financial makeup, which is awkward and unsatisfactory. The new Steam Pump Company will be an operating and not a holding organization like the present one, and there will be no conflicting interests created by a small minority interest in some subsidiary company.

The Hendey Machine Company, Torrington, Conn., announces that it has terminated its selling arrangement with H. P. Eilers, Singer Building, New York, and that it now has a branch office under its own management at room 901, in the same building.

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Small Railroad Building in 1914

New railroad mileage built in 1914 in the United States is the smallest since 1895, amounting to only 1532 miles, according to the Railway Age Gazette, or only 104 in excess of that of 1895. In 1913 new lines to the extent of 3071 miles were built and in 1912 2997 miles. The largest previous total was 6026 miles in 1902. Of second, third and fourth track only 2127 miles was constructed as against 4467 miles in 1913 and 4212 in 1912.

Bethlehem Additions Again Under Way

The Bethlehem Steel Company is resuming work on the additions to its plant which were under way at the outbreak of the European war. The completion of the new construction will be proceeded with as rapidly as possible. Some further extensions are taking shape in the company's plans.

The Iron and Metal Markets

MILL OPERATIONS GROW

Railroads Freely Ordering Track Supplies

Heavy Purchase of Line Pipe—Cast Pipe Makers Doing Large Business

Pittsburgh advices give a more favorable aspect to the steel trade. Mill operations in the district are now stated to be at 50 to 55 per cent. of capacity, which shows a considerable gain in the rate of production as compared with the preceding week.

Most interesting news has just been cabled to us by our London correspondent. He states that the British iron market is excited, with pig-iron prices rapidly rising. The makers of pig iron, especially producers of hematite or Bessemer iron, are now being obliged to pay 15 shillings (\$3.65) per ton for freight on ore from Spanish ports to Middlesbrough. Other branches of the iron trade are finding their costs advancing and are raising prices.

Our home markets show no great increase in buying. The railroads are quite freely placing orders for such track material as spikes, bolts and angle bars, but are not ordering large quantities of rails. Conspicuous among pending business for track material is that of the New York Central, which is inquiring for 30,000 kegs of spikes and bolts. It is reported that the Southern Pacific has bought 30,000 tons of rails, the Norfolk & Western Railroad has bought 5000 tons from the Carnegie Steel Company, and the United States Steel Products Company has booked orders from South America for 13,000 tons. The Burlington has bought 15,000 tons additional. The Baltimore & Ohio is inquiring for 25,000 tons and the Hocking Valley, 4000 tons. The New Haven's contract for 18,000 tons of rails has been practically awarded, 16,000 tons being divided between the Pennsylvania and Bethlehem Steel Companies, the remainder going to the Lackawanna Steel Company.

An exceptionally large order for line pipe has been taken by the National Tube Company for an oil line to run from Oklahoma to the Gulf of Mexico. This contract will require 40,000 tons of steel. While wrought pipe, aside from this order, shows no special activity, the cast-iron pipe trade is decidedly active. Chicago will shortly buy about 16,000 tons of cast pipe, and other contracts soon to be placed in that territory run the total up to about 25,000 tons. Pipe founders report brisk buying by gas companies and others who do not advertise their lettings, the volume of business of this character running much beyond its usual rate at this season.

The increased business among cast-iron pipe founders is causing a little more activity in lower grades of pig iron, Philadelphia reporting recent transactions aggregating some 10,000 tons. The general situation as to pig iron shows no relapse into dullness as had been feared might follow the heavy buying of December. Scattering purchases throughout the country and a considerable volume of inquiry are keeping pig-iron producers and merchants in good heart.

The structural trade is still considerably below its normal activity. The Bridge Builders and Structural Society reports that only 35 per cent. of the fabricating capacity of the country was contracted

for in December. Among new contracts just placed is that for the Kimball Building, Chicago, 5500 tons; an addition to be made to the New England Building, Cleveland, will require 2000 tons and a hotel at Columbus, Ohio, will take 1200 tons. A Western car builder has bought 7000 tons of shapes and plates for nearby requirements. Inquiries are out for 15,000 tons of steel for shrapnel, 10,000 tons being wanted by Russia and 5000 tons by Belgium.

The ferromanganese situation grows more complicated through the attitude of the British government, which now seeks to prevent all shipments of steel from this country to countries with which it is at war or to countries bordering on them, without first passing through London. It may be found exceedingly difficult if not impossible to meet this requirement. A Pittsburgh district steel company which imported several cargoes of manganese ore from Brazil some months ago is now producing its own ferromanganese and will be supplied for practically a year ahead.

Shipbuilders are experiencing an unprecedented demand for ships. Several more ships have been placed under contract the past week and inquiries are still coming forward.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Jan. 20, 1915	Jan. 13, 1915	Dec. 23, 1914	Jan. 21, 1914
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	\$14.25	\$14.25	\$14.25	\$14.50
No. 2, Valley furnace...	13.00	13.00	12.75	12.75
No. 2 Southern, Cin'ti...	12.40	12.40	12.40	13.75
No. 2, Birmingham, Ala...	9.50	9.50	9.50	10.50
No. 2, furnace, Chicago*	13.00	13.00	12.75	13.50
Basic, del'd, eastern Pa...	13.50	13.50	13.50	14.00
Basic, Valley furnace...	12.50	12.50	12.50	12.50
Bessemer, Pittsburgh...	14.55	14.55	14.70	14.90
Malleable Bess., Ch'go*	13.00	13.00	12.75	13.50
Gray forge, Pittsburgh...	13.45	13.45	13.40	13.40
L. S. charcoal, Chicago...	15.75	15.75	15.75	15.25

Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh...	19.50	19.00	19.00	20.00
O.-h. billets, Pittsburgh...	19.50	19.00	19.00	20.00
O.-h. sheet bars, P'gh...	20.50	20.00	20.00	20.00
Forging billets, base, P'gh...	24.00	24.00	24.00	24.00
O.-h. billets, Phila...	21.40	21.40	21.40	21.50
Wire rods, Pittsburgh...	25.00	25.00	25.00	25.50

Old Material, Per Gross Ton:				
Iron rails, Chicago...	11.50	11.25	11.00	13.00
Iron rails, Philadelphia...	13.00	13.00	13.00	15.50
Carwheels, Chicago...	10.00	10.00	9.75	11.75
Carwheels, Philadelphia...	11.00	11.00	10.25	12.50
Heavy steel scrap, P'gh...	11.75	11.75	11.00	11.00
Heavy steel scrap, Phila...	10.00	10.00	9.50	11.00
Heavy steel scrap, Ch'go...	9.50	9.00	8.50	9.50
No. 1 cast, Pittsburgh...	11.25	11.25	11.25	10.75
No. 1 cast, Philadelphia...	12.00	12.00	11.50	12.00
No. 1 cast, Ch'go (net ton)	9.25	9.25	9.25	10.25

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh...	1.17 1/2	1.17 1/2	1.17 1/2	1.20
Iron bars, Pittsburgh...	1.15	1.15	1.15	1.35
Iron bars, Chicago...	0.97 1/2	0.97 1/2	0.95	1.10
Steel bars, Pittsburgh...	1.10	1.10	1.05	1.20
Steel bars, New York...	1.26	1.26	1.21	1.36
Tank plates, Pittsburgh...	1.10	1.10	1.05	1.20
Tank plates, New York...	1.26	1.26	1.21	1.36
Beams, etc., Pittsburgh...	1.10	1.10	1.05	1.20
Beams, etc., New York...	1.26	1.26	1.21	1.36
Skelp, grooved steel, P'gh	1.10	1.10	1.10	1.20
Skelp, sheared steel, P'gh	1.15	1.15	1.15	1.30
Steel hoops, Pittsburgh...	1.20	1.20	1.20	1.35

Sheets, Nails and Wire,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	1.80	1.80	1.80	1.85
Galv. sheets, No. 28, P'gh	2.75	2.75	2.75	2.85
Wire nails, Pittsburgh...	1.55	1.55	1.50	1.55
Cut nails, Pittsburgh...	1.50	1.50	1.55	1.55
Fence wire, base, P'gh...	1.35	1.35	1.30	1.35
Barb wire, galv., P'gh...	1.95	1.95	1.90	1.95

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,

	Jan. 20, 1915.	Jan. 13, 1915.	Dec. 23, 1914.	Jan. 21, 1915.
Per Net Ton at Oven:	1915.	1915.	1914.	1914.
Furnace coke, prompt....	\$1.50	\$1.50	\$1.50	\$1.85
Furnace coke, future....	1.45	1.75	1.75	2.00
Foundry coke, prompt....	2.00	2.00	1.90	2.50
Foundry coke, future....	2.15	2.15	2.15	2.60

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York:	14.00	13.75	13.50	14.75
Electrolytic copper, N. Y.	13.87½	13.62½	13.25	14.37½
Spelter, St. Louis.....	6.10	5.90	5.50	5.10
Spelter, New York.....	6.25	6.05	5.65	5.25
Lead, St. Louis.....	3.50	3.50	3.65	3.97½
Lead, New York.....	3.70	3.70	3.80	4.10
Tin, New York.....	33.85	33.35	33.30	37.85
Antimony, Hallett's, N. Y.	17.00	15.00	13.50	7.00
Tin plate, 100-lb. box, P'gh	\$3.10	\$3.10	\$3.10	\$3.25

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal on plates, shapes, etc., is 46c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.10c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. ....	.10
Gauges under 3-16 in. to and including No. 8. ....	.15
Gauges under No. 8 to and including No. 9. ....	.25
Gauges under No. 9 to and including No. 10. ....	.30
Gauges under No. 10 to and including No. 12. ....	.40
Sketches (including straight taper plates), 3 ft. and over .....	.10
Complete circles 3 ft. in diameter and over. ....	.20
Boiler and flange steel .....	.10
"A. B. M. A." and ordinary firebox steel. ....	.20
Still bottom steel .....	.30
Marine steel .....	.40
Locomotive firebox steel .....	.50
Widths over 100 in. up to 110 in., inclusive. ....	.05
Widths over 110 in. up to 115 in., inclusive. ....	.10
Widths over 115 in. up to 120 in., inclusive. ....	.15
Widths over 120 in. up to 125 in., inclusive. ....	.25
Widths over 125 in. up to 130 in., inclusive. ....	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft. to 2 ft. inclusive. ....	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive. ....	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and tees, 3 in. and over, 1.10c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in. ....	.10
H-beams over 18 in. ....	.10
Angles over 6 in., on one or both legs. ....	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909. ....	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail) .....	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909. ....	.80
Deck beams and bulb angles. ....	.30
Handrail tees .....	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive. ....	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive. ....	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Products.—Fence wire, Nos 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.35; galvanized, \$1.75. Galvanized barb wire and fence staples to jobbers, \$1.95; painted, \$1.55. Wire nails to jobbers, \$1.55. Woven

wire fencing, 73 per cent. off list for carloads; 72 off for 1000-rod lots; 71 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.									
Nos.	0 to 9	10	11	12&12½	13	14	15	16	
Annealed	\$1.50	\$1.55	\$1.60	\$1.65	\$1.75	\$1.85	\$1.95	\$2.05	
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75	

Wire Rods.—Bessemer, open-hearth and chain rods, \$25.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from November 2, 1914, and iron pipe from June 2, 1913, all full weight.

Butt Weld					
Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1½, ¼ and ¾.....	74	53½	1½ and ¼.....	66	47
1½.....	78	67½	¾.....	65	46
¾ to 3.....	81	72½	1½.....	69	56
			¾ to 2½.....	72	61
Lap Weld					
2.....	78	69½	1½.....	56	45
2½ to 6.....	80	71½	1½.....	67	56
7 to 12.....	77	66½	2.....	68	58
13 and 14.....	63½	—	2½ to 4.....	70	61
15.....	61	—	4½ to 6.....	70	61
			7 to 12.....	68	55
Reamed and Drifted					
1 to 3, butt.....	79	70½	1 to 1½, butt.....	70	59
2, lap.....	76	67½	2, butt.....	70	59
2½ to 6, lap.....	78	69½	1½, lap.....	54	43
			1½, lap.....	65	54
			2, lap.....	66	56
			2½ to 4, lap.....	68	59
Butt Weld, extra strong, plain ends					
1½, ¼ and ¾.....	69	58½	¾.....	63	52
1½.....	74	67½	1½.....	67	60
¾ to 1½.....	78	71½	¾ to 1½.....	71	62
2 to 3.....	79	72½	2 and 2½.....	72	63
Lap Weld, extra strong, plain ends					
2.....	75	66½	1½.....	65	59
2½ to 4.....	77	68½	2.....	66	58
4½ to 6.....	76	67½	2½ to 4.....	70	61
7 to 8.....	69	58½	4½ to 6.....	69	60
9 to 12.....	64	53½	7 to 8.....	63	53
			9 to 12.....	58	47
Butt Weld, double extra strong, plain ends					
1½.....	64	57½	1½.....	57	49
¾ to 1½.....	67	60½	¾ to 1½.....	60	52
2 to 2½.....	69	62½	2 and 2½.....	62	54
Lap Weld, double extra strong, plain ends					
2.....	65	58½	2.....	55	49
2½ to 4.....	67	60½	2½ to 4.....	60	54
4½ to 6.....	66	59½	4½ to 6.....	59	53
7 to 8.....	59	48½	7 to 8.....	52	42

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		Standard Charcoal Iron	
1½ and 2 in.	62	1½ in.	45
2½ in.	59	2½ and 2 in.	49
2½ and 3½ in.	65	2½ in.	45
3 and 3½ in.	70	2½ and 2½ in.	54
3½ and 4½ in.	72	3 and 3½ in.	57
5 and 6 in.	65	3½ and 4½ in.	60
7 to 13 in.	62	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2½ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destination east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points. On standard charcoal iron tubes for desirable orders the above discounts are shaded an extra 5, and occasionally two 5's by some makers.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets		Cents per lb.
Nos. 3 to 8.....		1.25 to 1.30
Nos. 9 to 10.....		1.30 to 1.35
Nos. 11 and 12.....		1.35 to 1.40
Nos. 13 and 14.....		1.45 to 1.50
Nos. 15 and 16.....		1.55 to 1.60

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11.....	1.45 to 1.50
No. 12	1.45 to 1.50
Nos. 13 and 14.....	1.50 to 1.55
Nos. 15 and 16.....	1.55 to 1.60
Nos. 17 to 21.....	1.60 to 1.65
Nos. 22 and 24.....	1.65 to 1.70
Nos. 25 and 26.....	1.70 to 1.75
No. 27	1.75 to 1.80
No. 28	1.80 to 1.85
No. 29	1.85 to 1.90
No. 30	1.95 to 2.00

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11.....	1.75 to 1.80
No. 12	1.85 to 1.90
Nos. 13 and 14.....	1.85 to 1.90
Nos. 15 and 16.....	2.00 to 2.05
Nos. 17 to 21.....	2.15 to 2.20
Nos. 22 and 24.....	2.30 to 2.35
Nos. 25 and 26.....	2.45 to 2.50
No. 27	2.60 to 2.65
No. 28	2.75 to 2.80
No. 29	2.90 to 2.95
No. 30	3.05 to 3.10

Pittsburgh

PITTSBURGH, PA., January 19, 1915.

New orders in the steel trade since the first of the year have not been up to expectations, and specifications have not been so heavy as anticipated. Nevertheless, the Carnegie Steel Company received last week orders for between 90,000 and 100,000 tons of finished and semi-finished steel, included in which was a very large order for plates to be rolled into pipe for the Standard Oil interests. The market on plates, shapes and bars is holding firm at 1.10c. on new business, several of the larger sellers stating that they have turned down orders for these materials offered at lower prices. Operations of the mills at present are probably on a 50 to 55 per cent. basis, slightly better than in December. Pig iron is quiet, and the advance in billets and sheet bars made by the Carnegie Steel Company, is being held. Coke is very dull, and the upward movement in prices on scrap has stopped, the market being only fairly steady this week. The failure of the First National Bank of Uniontown, Pa., in which J. V. Thompson, the large coal and coke operator, is involved, may have the effect of unsettling prices on coke to some extent. It is not believed that any local banks will be seriously affected.

Pir Iron.—The only active inquiry out is that of the Westinghouse Electric & Mfg. Company for 20,000 to 25,000 tons of foundry iron for delivery over the last nine months of the year, it will probably be closed this week. The Westinghouse Machine Company has withdrawn from the market its recent inquiry. Bessemer and basic are quiet, but fairly strong. We note a sale of 1000 tons of basic iron at \$12.50, Valley furnace. We quote Bessemer iron at \$13.60; basic, \$12.50; malleable Bessemer, \$12.75; No. 2 foundry, \$13 to \$13.25, and gray forge, \$12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—The Carnegie Steel Company is now quoting \$19.50 to \$20 on Bessemer and open-hearth billets, and \$20.50 to \$21 on Bessemer and open-hearth sheet bars, and has made sales at these prices. Consumers of billets and sheet bars are pretty well covered over first quarter. We quote Bessemer and open-hearth billets at \$18.50, and Bessemer and open-hearth sheet bars \$19, f.o.b. maker's mill, Youngstown; Bessemer and open-hearth billets, \$19.50 to \$20, and Bessemer and open-hearth sheet bars, \$20.50 to \$21, f.o.b. maker's mill, Pittsburgh. Forging billets are quoted at \$24 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take \$1 per ton extra. Axle billets are quoted at \$21 to \$22.

Ferroalloys.—The Jones & Laughlin Steel Company has started to make 80 per cent. ferromanganese at one of its Aliquippa, Pa., furnaces, which is turning out about 110 tons per day, Brazilian ores being used. The company will make all the ferromanganese it needs, and this takes the second largest local consumer out of the market as a buyer. There is some inquiry for ferromanganese for spot shipment, and we note sales of 300 to 400 tons at prices said to average \$70 or slightly

higher. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72; over 600 tons, \$71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is \$19; 11 per cent., \$20, and 12 per cent., \$21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Steel Rails.—As yet the engineers of the Pennsylvania Railroad and the steel rail makers have not been able to come to a definite decision in regard to the specifications for the 170,000 tons of rails wanted by that road. The Pennsylvania engineers specified that after being rolled down from the ingot, the rail bloom shall be allowed to cool to the temperature of the air, and then reheated, and it is this re-heating process that the rail mills object to and for which they want an extra price. The matter will probably result in the Pennsylvania Railroad's placing about 2000 tons with each of the four mills that will participate in the order, and the price will then be agreed upon. The Carnegie Steel Company has taken 5000 tons of standard sections for the Norfolk & Western. The Baltimore & Ohio has an inquiry out for 25,000 tons and the Hocking Valley for 4000 tons. It is also stated that the United States Steel Products Company has taken 13,000 tons of standard sections for South America, which will be turned over to the Carnegie Steel Company and rolled at the Edgar Thomson mills. The demand for light rails is more active than for some time, and the Carnegie Steel Company received new orders and specifications last week for about 3000 tons. An inquiry is reported for 30,000 tons of rails to be shipped to Northern France. We quote standard section rails made of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. sections, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c.

Structural Material.—New inquiry in the past week was fair and some jobs were placed. The McClintic-Marshall Company has taken 150 tons for the International High-Speed Steel Company at Rockaway, N. J., also about 600 tons for new steel buildings for the Empire Rolling Mill Company, Warren, Ohio. The Fort Pitt Bridge Works was awarded 1500 tons for a coal breaker for the Lehigh & Wilkes Barre Coal Company. The American Bridge Company has taken 500 tons of bridge work for an Eastern road, and 1500 tons for a steel building in the West. We quote beams and channels up to 15-in. at 1.10c., f.o.b. Pittsburgh, for first quarter.

Plates.—It is stated that the Interborough Rapid Transit Company will in the near future place an order for 478 all-steel cars to be used in the subways in New York City. The company has placed 12 all-steel cars with the Pressed Steel Car Company. A local interest has recently booked 6000 to 8000 tons of plates for a Western car interest, and another mill has taken 4000 to 5000 tons for new boats. The steel car companies are doing practically nothing, and new demand for plates is quiet. We quote ¼-in. and heavier plates at 1.10c., f.o.b. Pittsburgh, for first quarter.

Tin Plate.—Probably 75 to 85 per cent. of all the tin plate that will be made in the first half of 1915, and 65 to 75 per cent. of the output for the second half is under contract. The mills report specifications coming in freely, and shipments against contracts, particularly to the Pacific coast, will start about February 1. Much of the tin plate for the coast this year will go via the Panama canal. The American Sheet & Tin Plate Company is operating this week to about 90 per cent. of capacity and other leading makers are running nearly as heavy. We quote 100 lb. 14 x 20 coke plates at \$3.10 to \$3.15 on current orders. On a very desirable contract the lower price might be slightly shaded.

Sheets.—Mills report new demand for prompt shipment sheets as fairly active, and specifications against contracts for delivery over the first quarter are coming in quite freely. While the sheet mills have more business on their books than for some time, prices have

shown no betterment. The current market on No. 28 black sheets is 1.80c., but this is sometimes shaded about \$1 a ton by a few mills on desirable orders. No. 28 galvanized sheets are held at 2.75c. Operations among the sheet mills range from 50 to 60 per cent. of capacity. Prices on blue annealed sheets are reported firmer. We quote No. 28 Bessemer black sheets at 1.80c.; No. 28 galvanized, 2.75c.; Nos. 9 and 10 blue annealed, 1.30c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Wire Rods.—Consumers who buy on contracts are pretty well covered for first half of 1915. Foreign inquiry is very dull and specifications are only fair. We quote Bessemer, open-hearth and chain rods at \$25, f.o.b. Pittsburgh, but on a very desirable contract this might be shaded.

Shafting.—New demand is reported better and specifications from large consumers such as the automobile builders and implement makers are coming in more freely. The large consumers of shafting are covered to April 1, and in some cases to July 1, at very low prices. We quote cold-rolled shafting at 67 to 68 per cent. off, depending on the order, delivered in base territory.

Railroad Spikes.—The New York Central inquiry, which is for 30,000 kegs, has not yet been placed, though it is expected it will be this week. The Western Maryland has bought 5000 kegs and a half dozen or more roads are inquiring for similar amounts. The New York Central has placed its order for chain, steel bars, wire nails and smaller products. We quote railroad spikes at \$1.35 to \$1.40, and small spikes at \$1.45 to \$1.50, in carload and larger lots, f.o.b. Pittsburgh, for first half.

Skelp.—A sale of about 1500 tons of grooved steel skelp, narrow sizes, is reported at 1.10c. for this and next month delivery. New demand is quiet, as pipe mills are not running to more than 30 to 35 per cent. of capacity. We quote: Grooved steel skelp, 1.10c. to 1.15c.; sheared steel skelp, 1.15c. to 1.20c.; grooved iron skelp, 1.50c.; sheared iron skelp, 1.50c. to 1.60c., delivered to consumers' mills in the Pittsburgh district.

Hoops and Bands.—For first quarter delivery steel bands are held at 1.10c. and steel hoops at 1.25c., but the price on hoops might be slightly shaded for prompt delivery. Consumers of hoops and bands are well covered through first quarter, but specifications so far are only fair. We quote steel bands at 1.10c., with extras as per the steel bar card, and steel hoops at 1.25c., f.o.b. Pittsburgh, for first quarter.

Wire Products.—New demand for wire and wire nails is only fair, as most jobbers and large consumers are covered through first quarter at prices ruling prior to the advance that went into effect on January 11. Mills report that specifications are coming in fairly well on wire nails, but on fence wire are quite active. We quote: Wire nails, \$1.55; plain annealed wire, \$1.35; galvanized barb wire and fence staples, \$1.95; painted barb wire, \$1.55, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. for cash in 10 days. Prices on woven wire fencing have not been changed as yet, and we quote 73 per cent. off in carload lots, 72 per cent. on 1000-rod lots and 71 per cent. on small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—New orders on steel bars since January 1 have been small, but this is on account of the fact that large consumers covered in December for first quarter delivery and mills state that specifications are coming in at a good rate. Reinforcing steel bars are more active, indicating an early starting of the building season. The demand for iron bars is dull, and in some cases 1.10c. is made for prompt shipment. We quote steel bars at 1.10c. for first quarter, and common iron bars, made from part scrap, at 1.10c. to 1.15c., f.o.b. Pittsburgh.

Merchant Steel.—New demand is mostly for small lots to cover current needs. Consumers who have con-

tracts are specifying only at a fair rate. Prices are more or less shaded, and on small lots for prompt shipment are about as follows: Iron finished tire, $\frac{1}{2}$ x $1\frac{1}{2}$ in., and larger, 1.30c., base; under $\frac{1}{2}$ x $1\frac{1}{2}$ in., 1.45c.; planished tire, 1.50c.; channel tire, $\frac{3}{4}$ to $\frac{7}{8}$ and 1 in., 1.80c. to 1.90c.; $1\frac{1}{2}$ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Cold-Rolled Strip Steel.—Makers report new demand better and state that specifications against contracts are coming in at a fair rate. The price of \$2.75 delivered per 100 lb., is reported as well maintained, being shaded only in exceptional cases by a few makers for desirable orders. We quote cold-rolled strip steel as follows: Hard-rolled steel, $1\frac{1}{2}$ -in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., \$2.75 delivered. Extras, which are standard among all the mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier.....	Base	\$0.25	\$0.10
0.099 to 0.050.....	\$0.05	0.25	0.15
0.049 to 0.035.....	0.20	0.25	0.15
0.034 to 0.031.....	0.35	0.40	0.25
0.030 to 0.025.....	0.45	0.40	0.40
0.024 to 0.020.....	0.55	0.40	0.50
0.019 to 0.017.....	0.85	0.50	1.10
0.016 to 0.015.....	1.25	0.50	1.10
0.014 to 0.013.....	1.95	0.50	1.25
0.012.....	2.30	0.50	coils only
0.011.....	2.65	0.50	coils only
0.010.....	3.00	0.50	coils only

Wrought Pipe.—The National Tube Company of this city has taken a contract from the Standard Oil Company for about 400 miles of 8-in. pipe, also a large quantity of 6-in. and considerable 12-in. pipe. This pipe will be used in laying oil lines north and south of the Oklahoma oil fields. Upward of 40,000 tons of plates will be needed and the order has been placed with the Carnegie Steel Company for the Homestead works. It is stated that several other lines are being considered. The proposition to build an oil line from the Oklahoma oil fields to Port Arthur, Tex., has been dropped for the present. The general demand for wrought iron and steel pipe is fair and the mills are running 35 to 40 per cent. of capacity. Discounts are reported firmly held.

Boiler Tubes.—The new demand for locomotive and merchant tubes is quiet, most large consumers of locomotive tubes being covered by contracts up to April 1 or longer. Discounts continue to be more or less shaded.

Coke.—Most active blast furnaces are covered for furnace coke up to July 1 or longer, and there is no new inquiry. New demand for foundry coke is fair. Prices on coke seem to be slightly weaker, and some standard grades are being offered at \$1.65 per net ton at oven on contracts for delivery up to July 1. We quote standard makes of blast furnace coke for prompt shipment at \$1.50 to \$1.60, and on contracts at \$1.65 to \$1.75 per net ton at oven. Best grades of 72-hr. foundry coke are held at about \$2 for prompt shipment and \$2.15 to \$2.25 per net ton at oven on contracts for delivery up to July 1. The Connellsville Courier reports the output of coke in the upper and lower Connellsville region for the week ended January 9 as 206,602 tons, an increase over the previous week of 4105 tons.

Old Material.—The upward movement in prices of scrap, which has been a feature of the market for four or five weeks past, has stopped, and while the market is firm at last week's prices, it is not any higher. It is stated that the Baltimore & Ohio Railroad sold its heavy steel scrap this month at \$12.15, and the Pennsylvania at \$12.25, f.o.b. Pittsburgh. In the case of the Pennsylvania, buyers are not required to specify within 60 days from date of contract, and dealers usually pay about 50c. above the ruling market, and take a chance on the price being higher when they take the scrap out. Sales are reported of 2000 to 2500 tons of bundled sheet scrap at \$9.75 and up to \$10, about 2000 tons of selected heavy steel scrap at \$11.75, 500 tons at \$11.50,

which was sold short, and 1500 to 1800 tons of turnings at \$7.75 to \$8, all delivered to consumers in the Pittsburgh and nearby districts. For delivery to consumers' mills in the Pittsburgh and other consuming districts that take Pittsburgh freights, dealers quote as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$11.75
Compressed side and end sheet scrap	\$10.50 to 10.75
No. 1 foundry cast	11.25 to 11.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.50 to 9.75
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.00 to 10.25
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	13.25 to 13.50
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	9.75 to 10.00
No. 2 busheling scrap	7.00 to 7.25
Machine shop turnings	7.75
Old carwheels	10.75 to 11.00
Cast-iron borings	8.25 to 8.50
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

Chicago

CHICAGO, ILL., January 20, 1915.—(By Wire.)

In the iron and steel markets affairs are moving in a decidedly livelier fashion, despite the slow gains in volume of business. This is a normal contracting season for the railroads, and where they are delinquent in specifications they seem willing at least to cover for such requirements as now confront them. Western roads have done nothing with rails thus far, but local mills will roll part of the New York Central requirements, of which 20,000 tons has thus far been placed. The activity of the Canadian rail mill seems to have been limited to small lots, which aggregate less than 20,000 tons. The Louisville & Nashville is taking 1700 tons of angle bars, and prominent among spike and bolt inquiries is the New York Central's 30,000 kegs. The principal structural letting at Chicago was the 5500 tons for the Kimball Building, while some railroad contracts for shapes and reinforcing bars are being negotiated. An inquiry for 400 steel ore cars is the only new car business of importance to the plate mills, whose business from tank builders has, however, been better. A decided flurry in the scrap market rising largely out of the purchases of a local rolling mill, carried prices up to a point where at least a temporary reaction made itself felt. Cast-iron pipe sold or about to be placed in this territory totals about 25,000 tons, of which the principal item is 16,000 tons for the city of Chicago. Inquiry for pig iron covers larger tonnages, while the free shipping of iron on contracts is adding to the stability of the present situation.

Pig Iron.—Inquiry, largely for Northern iron, has broadened out somewhat in the past 10 days. One melter is in the market for about 2000 tons. A Michigan stove manufacturer is asking prices on an aggregate of 1200 tons, and there is noted an inquiry for about 1000 tons of malleable. Other business in sight runs the total of which there are reasonable prospects for closing up to about 10,000 tons. The market has every appearance of being established at the \$13 furnace price. Southern iron, while regularly quoted as low as \$9.50 at Birmingham, appears more susceptible to concessions, although these are made more by way of liberal analysis specifications and in connection with transactions other than direct furnace sales. A somewhat similar situation appears to have obtained in connection with charcoal iron despite the apparently rigid maintenance of furnace quotations. The second Inland furnace was blown in January 15, and it is planned to blow in Zenith furnace some day this week. The Thomas Furnace Company, Milwaukee, has already sold several thousand tons of low phosphorus pig iron to be made at its Milwaukee stack, although it is not planned to blow the furnace in on this iron before the opening of navigation, when the company's

supply of low phosphorus ore will be available. It is understood that a price of \$18.75, Chicago, has been made on this iron. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal	\$15.75 to \$16.75
Northern coke foundry, No. 1	13.25 to 13.75
Northern coke foundry, No. 2	13.00 to 13.25
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	13.75 to 14.25
Southern coke, No. 2 f'dry and 2 soft	13.50 to 13.75
Malleable Bessemer	13.00 to 13.25
Standard Bessemer	15.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. silvery, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. silv'y, 10 per cent.	18.90 to 19.40

(By Mail)

Rails and Track Supplies.—The present activity of the railroads, to be correctly appraised, must be considered not only in the light of their recent embargo on purchases but also as compared with their normal activity at this season of the year. Buying is still on a conservative scale. Aside from 20,000 tons understood to have been placed thus far by the New York Central Lines, this market has received no new rail orders although unconfirmed reports are current of 30,000 tons bought by the Southern Pacific and an inquiry for several thousand tons from the Frisco System. The Louisville & Nashville is inquiring for about 1700 tons of angle bars and the New York Central has contracted for its requirements of spikes and kegs estimated at 40,000 kegs. Contracting for track fastenings has been quite general with the railroads, but with one or two exceptions, where local roads have discussed their 1915 requirements with the mills, rails have had little attention. We quote standard railroad spikes at 1.50c. to 1.60c., base; track bolts with square nuts, 1.90c. to 2c. base, all in carload lots, Chicago; tie plates, \$23.50 to \$25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—The Kimball Building, Chicago, which is to be erected in two sections calling for an aggregate of about 5500 tons, has been placed with the American Bridge Company, the first section calling for about 1500 tons. Figures are being taken by local architects for 1800 tons of shapes and about 300 tons of reinforcing bars for the Deschler Hotel, Columbus, Ohio. Other architectural work is limited, the contracts reported for last week including about 426 tons taken by the Minneapolis Steel & Machinery Company and 154 tons for a high school building at Oshkosh, Wis. A number of railroads are preparing to contract for bridge steel, although the tonnage in each case appears to be small. The Chicago & Northwestern will soon ask prices on about 1000 tons, and the Chicago, Milwaukee & St. Paul has placed 151 tons for a subway at Milwaukee with the Milwaukee Bridge Company. The Sanitary District of Chicago has awarded 365 tons for highway bridges to the Chicago Bridge & Iron Works. Prices for fabricated steel are very low, less than \$40 per ton having been done on recent architectural tonnage in Chicago. For plain shapes from mill the base price of 1.10c., Pittsburgh, is being adhered to without exception and is generally unquestioned by the trade. We quote for Chicago delivery of structural shapes from mill 1.289c.

Store orders reached a somewhat better aggregate last week as compared with the several weeks preceding, but the volume of business is still distinctly subnormal. We continue to quote for shapes out of stock 1.75c.

Plates.—Following the placing of about 1000 stock and refrigerator cars with the Haskell & Barker Car Company the only new inquiry of importance is that of the Lake Superior & Ishpeming for 400 steel ore cars. A number of inquiries are noted for from one to six cars for passenger service. The American Car & Foundry Company has placed what is for it a small contract for car steel, reported as aggregating about 7000 tons. From other sources plate business has been

somewhat better, orders for tank plates for oil tanks in the southwestern field being of special comment. Among the leading makers of plates there appears to be no departure from the price of 1.10c., Pittsburgh, either made or contemplated, but some business has been taken by other mills at slight concessions. We quote for Chicago delivery of plates from mill 1.25c. to 1.289c.

We quote for Chicago delivery of plates out of stock 1.75c.

Sheets.—The sheet business being booked by mills is only fair. Among the present sources of business may be noted the builders of highway culverts, of silos and dealers in roofing sheets. Jobbers appear to be maintaining their stocks on a very conservative basis. The market is unimproved as to prices although some of the mills appear to have so far yielded to the pressure of competitive selling as to be on the verge of a reaction. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.989c.; No. 28 galvanized, 2.889c. to 2.939c.

We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.55c.

Bars.—The demand for reinforcing bars displays a satisfactory improvement. The tonnage of bars for highway road building and bridges is assuming important proportions. A local railroad is about to contract for its year's requirements of reinforcing steel, the tonnage to run something over 2000. Specifications for mild steel bars are routine, with rather a good week reported from some offices. Bar iron is slowly moving toward a position of greater firmness, although prices are still quotable as low as 0.97½c., minimum prices being obtainable by buyers with increasing difficulty. We quote for mill shipments as follows: Bar iron, 0.97½c. to 1.02½c.; soft steel bars, 1.289c.; hard steel bars, 1.20c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—Railroad negotiations covering bolt requirements for the year continue to be the business of greatest interest. The supply in this market of rivets is so disproportionate to the demand that the market affords few features of interest. Rivet prices have departed entirely from anything but a local base. We continue to quote: Carriage bolts up to ¾ x 6 in., rolled thread, 85; cut thread, 80-20; larger sizes, 80; machine bolts up to ¾ x 4 in., rolled thread, 85-5; cut thread, 85; larger sizes, 80-5; coach screws, 85-10; hot pressed nuts, square head, \$6.60 off per cwt.; hexagon, \$7.60 off per cwt. Structural rivets, ¾ to 1¼ in., 1.55c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Nominally we quote out of store: Structural rivets, 2.20c.; boiler rivets, 2.30c.; machine bolts up to ¾ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ¾ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square head, \$6, and hexagon, \$6.70 off per cwt.

Wire Products.—The advance in wire prices to the base of 1.55c., to which attention was called a week ago, was responsible for the placing of very fair specifications and shipments have been correspondingly improved the past week. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.539; wire nails, \$1.739; painted barb wire, \$1.739; galvanized, \$2.139; polished staples, \$1.739; galvanized, \$2.139, all Chicago.

Cast-Iron Pipe.—In anticipation of spring pipe laying, municipal orders for pipe have become much more plentiful and tonnages under consideration aggregate nearly 22,000, in addition to about 2800 tons placed last week. Of the business in sight the most important is 16,000 tons for Chicago, of which 3600 tons is to be let January 23 and 12,400 tons January 25. At St. Paul 1200 tons is being awarded to-day, the National Pipe Company being the low bidder. Awards are to be made January 23 of 1700 tons at Sioux City, Iowa, 1800 tons January 21 at Columbus, Ohio, 700 tons January 19 at Kansas City, Kan., and 300 tons January 21 at Michigan City, Ind. The American Cast Iron Pipe Company took the 1500 tons at Kansas City and the leading

interest the 1000 tons at Cincinnati. Prices show a tendency toward greater firmness. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$23.50; 16 in. and up, \$23, with \$1 extra for gas pipe.

Old Material.—The past week in the local scrap market has been one of decided activity, one mill in particular being a prominent participant in the buying. Purchases of railroad wrought, pipes and flues, turnings, iron axles and other grades of rolling-mill scrap have been prominent, but the transactions of first interest were the sales of busheling scrap, of which it seems probable 3000 to 4000 tons changed hands. The price of \$8.75 for No. 1 busheling, to which the market attained in connection with the buying of the week, represents an advance of \$2 per ton from the low point a few weeks ago. The desire for profit taking at this figure seems to have completely changed the complexion of the market and what was a scarcity of busheling was transformed into an overabundance. At the date of this report there is in evidence a desire on the part of those who have scrap accumulations to realize upon them at current prices in excess of any apparent consumer demand for the material and sales are being made at lower figures. Something of the condition of the market earlier in the week is indicated by the fact that in dealers' and railroad sales last week heavy melting steel sold as high as \$9.75; iron axles, \$14.50; No. 1 wrought, \$9.55, and No. 2 wrought, \$9. Prices paid by consumers have thus far failed to reach these figures. Additional offerings of railroad scrap this week are small and include about 2400 tons from the Michigan Central, about 1200 tons from George W. Jennings, a blank list from the Lake Shore & Michigan Southern and a small tonnage from the Chicago & Alton. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$11.50 to \$12.00
Old steel rails, rerolling	9.75 to 10.25
Old steel rails, less than 3 ft.	10.00 to 10.25
Old carwheels	10.00 to 10.50
Heavy melting steel scrap	9.50 to 9.75
Frogs, switches and guards, cut apart	9.50 to 9.75
Shoveling steel	8.75 to 9.25
Steel axle turnings	7.50 to 7.75

Per Net Ton	
Iron angles and splice bars	\$11.25 to \$11.75
Iron arch bars and transoms	11.25 to 11.75
Steel angle bars	8.25 to 8.50
Iron car axles	14.00 to 14.50
Steel car axles	11.00 to 11.50
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	8.75 to 9.00
Cut forge	8.75 to 9.00
Steel knuckles and couplers	8.50 to 8.75
Steel springs	9.25 to 9.75
Locomotive tires, smooth	8.50 to 9.00
Machine shop turnings	5.75 to 6.00
Cast borings	4.75 to 5.25
No. 1 busheling	8.50 to 8.75
No. 2 busheling	7.25 to 7.50
No. 1 boilers, cut to sheets and rings	5.50 to 6.00
Boiler punchings	8.25 to 8.50
No. 1 cast scrap	9.25 to 9.50
Stove plate and light cast scrap	8.25 to 8.50
Grate bars	8.00 to 8.25
Railroad malleable	8.25 to 8.50
Agricultural malleable	7.25 to 7.50
Pipes and flues	7.50 to 8.00

Philadelphia

PHILADELPHIA, PA., January 19, 1915.

Not much change is observed in this market except, in some directions, a slight check in activity which is not, however, sufficient to impair the better sentiment that developed recently. The railroads are more generous buyers of track equipment, but still inactive in the purchase of cars and locomotives which in normal times contributes heavily to the activity of local mills. The Pennsylvania Railroad has placed with various mills contracts for its 1915 requirements of tie and splice plates, forging blooms, spring steel and track bolts and spikes. The quantities of these which ultimately will be used is problematical. Steel bars and shapes are quieter. Plates and sheets are a little more active, the former having been stimulated by shipbuilding as well as by miscellaneous demand. Foreign inquiry for billets runs into thousands of tons, but exports are blocked by high ocean freights. Standard foundry irons have been dull, but there has been some

improvement in pipe iron and some renewals of contracts for standard low phosphorus iron. England has laid down stricter regulations to govern shipments of ferromanganese, buyers now being asked to ship no steel at all to Germany, Austria or Turkey. The local demand for old material shows but slight improvement.

Iron Ore.—Importations of ore at this port in December aggregated 23,400 tons. None was reported in the week ended January 16.

Pig Iron.—Foundry irons have continued dull, which is not unexpected in view of the heavy buying in late December. There is some disappointment that deliveries have not increased, but that they are holding up as well as they are is a cause for some satisfaction. In fact, the situation is regarded as healthy in a statistical way in view of the manner in which shipments are almost keeping pace with production, while the stocks in buyers' yards are pretty well depleted. Delaware River pipe works are willing to buy several thousand tons of gray forge and No. 3 iron, providing they can get bargain prices, one such inquiry being for 3000 tons. Both Virginia and Alabama iron have been extremely quiet. In basic, little interest is shown, but in standard low phosphorus there have been some renewals of contracts for deliveries running far ahead which aggregate a large total. The price obtained for standard brands was \$20 to \$20.50, delivered, while iron which is under standard specifications sold at \$19.50. Other sales included charcoal iron and special analysis foundry irons to the extent of about 1100 tons. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X foundry.....	\$14.25 to \$14.50
Eastern Penna. No. 2 plain.....	14.00 to 14.25
Virginia No. 2 X foundry.....	15.25
Virginia No. 2 plain.....	15.00
Gray forge	13.50 to 13.75
Basic	13.50 to 14.00
Standard low phosphorus	20.00 to 21.00

Ferroalloys.—The latest development reported is that the British Government has refused to accept some of the guarantees which buyers of 80 per cent. ferromanganese were asked to give at the time of purchase, to the effect that they would not resell the ferromanganese they received, nor any of the products in which it might enter, to England's foes. It is now demanded that the buyers agree not to sell any steel at all to Germany, Austria or Turkey. Meanwhile inquiry is light. The nominal quotation is unchanged at \$68, seaboard. Importations in December amounted to 821 tons. The quotations for 50 per cent. ferrosilicon stand at \$71 to \$73, Pittsburgh.

Bars.—Specifications for steel bars have been very light, but makers assert that they have no inclination to invite business by quoting under the recently established minimum of 1.25c., Philadelphia, for prompt business and 1.30c. for second quarter. The demand for iron bars improves but slowly. Makers are holding to 1.17½c., Philadelphia, for a good grade.

Plates.—From last Tuesday on there was a betterment in the demand from miscellaneous sources, some of the orders being of the hurry-up variety. Shipbuilders were purchasers in some instances, and the outlook in this direction is distinctly better. The New York Shipbuilding Company will build two freight steamers for the Coastwise Transportation Company of Boston, the combined cost of which will be \$1,000,000. The ships are to be delivered in 10 months and one year. The Ocean Steamship Company of Savannah has under negotiation the building of two combined passenger and freight vessels. This company for a number of years has been having its boats built abroad. Plate-makers have been obliged to refuse some foreign business for the reason that the high ocean freights were to be paid by the shipper and brought the price down to less than 1c. The quotation for first quarter delivery is 1.25c., Philadelphia, and for second quarter, 1.30c.

Structural Material.—Contrary to any stimulation of business there has been another check in the estimation of representatives of mills in this territory. New propositions are notable by their absence only. A project to build a high school in this city is in an incipient stage. Quotations are unchanged at 1.25c., Philadelphia, for first quarter and 1.30c. for second.

Sheets.—A slightly better demand is noted but consumers still expect to obtain low prices. Quotations on No. 10 blue annealed range from 1.45c. to 1.50c., Philadelphia.

Billets.—The feature of the market is a strong demand from foreign consumers, but business in this direction has been blocked by the high ocean freights and the scarcity of vessels. One company which accepted an order finds itself in the position of being unable to make deliveries. One inquiry is for 4000 tons of nickel-chrome steel. A producer has been offered export orders for 7000 tons of billets, but too low a price is named by the foreign consumer. Open-hearth rolling billets are quoted at \$21.40, Philadelphia, with forging steel running \$4 higher.

Coke.—Except for occasional sales of carload lots the market is without activity. Quotations are unchanged. Prompt standard Connellsville furnace coke is held at \$1.60 per net ton at oven, and contract furnace at \$1.75. Prompt foundry is \$2 to \$2.20 and contract \$2.10 and \$2.30. Freight rates from the principal producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—Not much demand has developed, so far as the mills are concerned, in heavy melting steel, although there has been some purchasing by dealers. Some little interest has been shown by consumers in the lighter kinds of scrap, but few sales have been made. It is felt that the demand in other districts is receding a little. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel.....	\$10.00 to \$10.50
Old steel rails, rerolling.....	10.50 to 11.00
Low phosphorus heavy melting steel	
scrap	14.00 to 14.50
Old steel axles	13.50 to 14.00
Old iron axles	17.50 to 18.00
Old iron rails	13.00 to 14.00
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
Wrought-iron pipe	9.75 to 10.25
No. 1 forge-fire	8.00 to 8.50
Bundled sheets	8.00 to 8.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
No. 1 cast	12.00 to 12.50
Grate bars, railroad	8.50 to 9.00
Stove plate	8.50 to 9.00
Railroad malleable	9.00 to 9.50

Buffalo

BUFFALO, N. Y., January 19, 1915.

Pig Iron.—The week has shown some betterment in inquiry and bookings, with a firming of prices, although no large tonnages have been under negotiation. The aggregate of sales has been about 8000 tons, all grades, taken at an average of a little over \$13 at furnace for standard grades of foundry and malleable. The concessions at which low silicon irons were sold in some instances during the preceding two weeks are less in evidence. One producing interest states it is holding its No. 1 grade at \$13.75. A few of the foundries of the district which have been running on reduced time for months have suddenly become quite busy and are calling for shipments on contracts at a rate that will soon absorb the total of their first quarter purchases. The majority of melters, however, are still running on short time and some are shut down on account of inventory and repairs. We quote as follows, f.o.b. furnace, for first half delivery:

No. 1 foundry.....	\$13.25 to \$13.50
No. 2X foundry.....	13.00 to 13.25
No. 2 plain.....	13.00
No. 3 foundry.....	12.75 to 13.00
Gray forge	12.75 to 13.00
Malleable	13.00 to 13.25
Basic	13.25 to 13.50
Charcoal, regular grades and analysis	16.00 to 17.00

Finished Iron and Steel.—Specifications are in fair volume against contracts already closed. New inquiry for small tonnages is developing but a number of buyers who felt that there would be no advance in price after the first of the year are withholding orders, waiting to see whether the present level will hold. Sellers

are firm. Some producers are not anxious to take on contract tonnage for plates and structural shapes for second quarter at 1.15c., Pittsburgh, believing that higher figures will be obtained later. The week has shown a fair business in wrought pipe. One agency reports more inquiry for new power transmission the past week than in any single month of last year. There is evidence of the setting in of increased activity in building lines. Architects report a number of new projects under consideration. Contract was today awarded to the Monarch Engineering Company for the erection of a million-bushel grain elevator on the Buffalo River by the Eastern Grain, Mill & Elevator Corporation, requiring about 500 tons of concrete reinforcing bars and 500 tons of structural steel. Bids will soon be called for on steel for a four-story warehouse to be erected at Lestershire, N. Y., by the Endicott-Johnson Company, taking about 500 tons, and also for the new Lehigh Valley terminal passenger station, this city, requiring about 1500 tons of structural steel.

Old Material.—The entire list shows an improved demand and prices have advanced accordingly. Heavy melting steel, cast scrap, wrought scrap, turnings and borings are the leaders in this improvement. No large sales have been made as yet from this district, but the aggregate of small sales has been quite large. There is a tendency among dealers to hold for better prices the scrap they have taken into yards. We quote dealers' asking prices, per gross ton, f.o.b., Buffalo, as follows:

Heavy melting steel.....	\$10.25 to \$10.75
Low phosphorus steel.....	12.50 to 13.00
No. 1 railroad wrought scrap.....	10.00 to 10.50
No. 1 railroad and machinery cast.....	10.50 to 11.00
Old steel axles.....	12.00 to 12.50
Old iron axles.....	16.00 to 16.50
Old carwheels.....	10.00 to 10.50
Railroad malleable.....	9.50 to 10.00
Machine shop turnings.....	5.50 to 6.00
Heavy axle turnings.....	8.50 to 9.00
Clean cast borings.....	5.75 to 6.50
Old iron rails.....	11.00 to 11.50
Locomotive grate bars.....	9.00 to 9.50
Stove plate (net ton).....	8.25 to 8.75
Wrought pipe.....	6.50 to 7.00
Bundled sheet scrap.....	7.00 to 7.50
No. 1 busheling scrap.....	7.50 to 8.00
No. 2 busheling scrap.....	5.25 to 5.75
Bundled tin scrap.....	10.00

Cleveland

CLEVELAND, OHIO, January 19, 1915.

Iron Ore.—The question of ore prices for 1915 has apparently been given little thought by furnacemen, as ore people have not been approached as yet on the subject of prices. What the prices will be for the season will depend to a large extent on the development of business conditions in the next few weeks. We repeat 1914 prices as follows: Old range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; old range non-Bessemer, \$3; Mesaba non-Bessemer, \$2.85.

Pig Iron.—With nearly all consumers under contract or with enough iron left over to supply their needs for some time, the market is as dull as at any time in the past few months, and dealers do not look for much activity for several weeks. No sales of any size were made and there is almost a total absence of inquiry. Prices on Northern No. 2 foundry iron are unchanged. Southern iron shows no strength. One interest that has been adhering to \$10, Birmingham, for No. 2 has reduced its price to \$9.75, at which it has made a few small sales. Other prices on Southern iron range from \$9.50 to \$10. A Cleveland agency has sold 700 tons of Southern charcoal iron in the Pittsburgh district at a sharp decline from recent prices. Some Ohio silvery iron has been sold on a basis of \$15.50 at furnace for 8 per cent., which fairly represents the present market price, being a decline of 50c. per ton. While some foundries in this territory are busier than before the end of the year, the average foundry operations appear to be not over 50 per cent. of capacity. We quote, delivered Cleveland, as follows:

Bessemer.....	\$14.55
Basic.....	13.45
Northern No. 2 foundry.....	13.50
Southern No. 2 foundry.....	\$13.50 to 14.00
Gray forge.....	13.00
Jackson Co. silvery 8 per cent. silicon.....	17.12
Standard low phos., Valley furnace.....	20.00 to 20.25

Coke.—There is no demand for furnace grades and

very little for foundry coke. Prices are unchanged. We quote standard makes of furnace coke at \$1.50 to \$1.60 per net ton at oven for spot shipment and \$1.75 for contracts. Best makes of foundry coke are held at \$2.25 to \$2.50 for prompt shipment and contracts.

Finished Iron and Steel.—Mills are getting a fairly large number of current orders and specifications for small lots of steel, which make a fairly satisfactory aggregate, and the general sentiment in the steel trade has improved. Prices on steel bars and structural material are firmly maintained at 1.10c., Pittsburgh. Plates are firmer than they were, but the 1.10c., Pittsburgh, price is still being shaded by one or more of the smaller mills for desirable orders. New structural inquiry includes 2000 tons for an addition to the New England Building, Cleveland, and 1200 tons for the Deshler Hotel, Columbus. Two rail inquiries have come from Ohio roads, each for 1000 tons. Inquiries are out for 15,000 tons of steel for shrapnel cases, one for 10,000 tons from Russia and one for 5000 tons from Belgium. The sheet market is quiet, but prices are firmer and are being well maintained in this market at 1.80c., Ohio mills, for No. 28 black; 2.75c. to 2.80c. for No. 28 galvanized and 1.35c. for No. 10 blue annealed. Bar iron is in light demand and prices continue weak and irregular. For Cleveland delivery we quote iron bars at 1.15c. to 1.20c. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—The demand for bolts and nuts has improved considerably over December, and while prices are still weak and irregular, some of the makers are not making as low quotations as they did a few weeks ago. There is little new demand for rivets, consumers being generally under contract, but prices have stiffened up somewhat and structural rivets are generally quoted at 1.45c., Pittsburgh, and boiler at 1.55c. Regular discounts are as follows: Common carriage bolts $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 80 and 10 and 5 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, $\frac{3}{4}$ x 4 in., smaller or shorter, rolled thread, 80 and 10 and 10 per cent.; cut thread, 80 and 10 and 5 per cent.; larger or longer, 80 per cent.; coach and lag screws, 80 and 5 per cent.; square h. p. nuts, blank or tapped, \$6.50 off; hexagon h. p. nuts, blank or tapped, \$7.40 off; c. p. c. and t. square nuts, blank or tapped, \$6.20 off; hexagon, $\frac{1}{2}$ in. and larger, \$7.50 off; $\frac{9}{16}$ in. and smaller, \$8 off; semi-finished hexagon nuts, $\frac{1}{2}$ in. and larger, 85, 10 and 10 per cent.; $\frac{9}{16}$ in. and smaller, 85, 10, 10 and 10 per cent.

Old Material.—The demand for scrap has improved and the market is very firm, with price advances on several grades. Producers are holding out for better prices and dealers are willing to sell only small lots at current quotations. Dealers are asking \$10.50 for heavy melting steel scrap for Cleveland delivery. However, in the absence of reported sales at higher prices, last week's maximum quotation in this grade is unchanged. Heavy steel in the Valley is quoted at \$11.25 and sales in Steubenville are reported at \$12. New busheling is firmer, a round lot sale being reported at \$9. Turnings are very firm, having sold up to \$6. Borings are also 25c. per ton higher. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Old steel rails, rerolling.....	\$11.00 to \$11.75
Old iron rails.....	12.00
Steel car axles.....	12.75 to 13.25
Heavy melting steel.....	9.75 to 10.00
Old carwheels.....	10.00 to 10.50
Relaying rails, 50 lb. and over.....	23.00 to 25.00
Agricultural malleable.....	8.00 to 8.50
Railroad malleable.....	9.75 to 10.00
Light bundled sheet scrap.....	8.00 to 8.50
Per Net Ton	
Iron car axles.....	\$16.00 to \$16.50
Cast borings.....	6.00 to 6.50
Iron and steel turnings and drillings.....	5.50 to 6.00
Steel axle turnings.....	6.00 to 6.25
No. 1 busheling new.....	8.75 to 9.00
No. 1 busheling old.....	8.25 to 8.50
No. 1 railroad wrought.....	9.25 to 9.75
No. 1 cast.....	10.00 to 10.50
Stove plate.....	7.50

The Vilter Mfg. Company, Milwaukee, Wis., has issued a long list of recent sales of refrigerating apparatus and ice-making machinery. The buyers named represent all sections of the country.

Cincinnati

CINCINNATI, OHIO, January 20, 1915.—(By Wire.)

Pig Iron.—Prices of foundry iron are unchanged and the new inquiry is comparatively light. Some business is under negotiation in Indiana but buyers are holding back, and few contracts have been closed lately. A nearby foundry bought last week 400 tons of Southern and 200 tons of Northern foundry iron for first half shipment. A central Ohio melter took 500 tons of Southern foundry. A local firm reports the sale of 1000 tons of Southern iron to a central Illinois consumer for first quarter shipment. Among the few general inquiries out is one from northern Ohio for approximately 800 tons of mixed Northern and Southern grades. A few buyers are sounding the market for third quarter and last half delivery, but the furnaces are not now willing to quote that far ahead. While a number of small contracts for Southern iron have been made at \$9.75 and \$10 for first half shipment a few standard brands can be bought at \$9.50, Birmingham. Ohio silvery irons continue to show weakness, and some business has been taken below \$15 at furnace. Quite a number of inquiries for high silicon iron are before the trade. Both malleable and basic are very quiet, with no business in sight from any source. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$12.90 to \$13.40
Southern coke, No. 2 f'dry and 2 soft.	12.40 to 12.90
Southern coke, No. 3 foundry.	11.90 to 12.40
Southern No. 4 foundry.	11.40 to 11.90
Southern gray forge.	10.90 to 11.40
Ohio silvery, 8 per cent. silicon.	16.01 to 16.26
Southern Ohio coke, No. 1.	15.01 to 15.51
Southern Ohio coke, No. 2.	14.01 to 14.51
Southern Ohio coke, No. 3.	13.76 to 14.01
Southern Ohio malleable Bessemer.	14.26
Basic, Northern.	14.26
Lake Superior charcoal.	15.25 to 17.25
Standard Southern carwheel.	26.90 to 27.40

(By Mail)

Coke.—Little new business in either furnace or foundry coke has been closed lately, but shipments on old contracts are more satisfactory. Prices are unchanged.

Finished Material.—The local mill has reduced its prompt shipment quotation on sheets to 1.95c., f.o.b. Cincinnati or Newport, Ky., for No. 28 black, and 2.95c. for No. 28 galvanized. An increase in the number of orders booked is noted, and there is also considerable interest manifested in future shipment business. At the present time the sheet mills are not willing to meet buyers' views for forward deliveries, but the increase in the number of inquiries in hand is an encouraging feature of the situation. Warehouse prices on steel bars and small structural shapes are unchanged at 1.70c. to 1.75c. Hoops and bands are very quiet.

Old Material.—A reaction has set in that has put back prices approximately 25c. per ton on all grades of scrap iron. Heavy railroad offerings in other markets, together with the inability of the large consumers in this territory to absorb the average quantity of scrap, is given as the reason for a reduction in quotations. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton	
Bundled sheet scrap	\$6.25 to \$6.75
Old iron rails	11.00 to 12.00
Relaying rails, 50 lb. and up.	19.75 to 20.25
Re-rolling steel rails.	9.75 to 10.25
Melting steel rails	8.75 to 9.25
Heavy melting steel scrap.	8.50 to 9.00
Per Net Ton	
No. 1 railroad wrought.	\$7.50 to \$8.00
Cast borings	4.00 to 4.50
Steel turnings	4.00 to 4.50
Railroad cast scrap.	9.25 to 9.75
No. 1 machinery cast scrap.	9.75 to 10.25
Burnt scrap	6.00 to 6.50
Old iron axles	13.50 to 14.00
Locomotive tires (smooth inside)	8.75 to 9.25
Pipes and flues	5.50 to 6.00
Malleable and steel scrap	6.75 to 7.25
Railroad tank and sheet scrap.	4.50 to 5.00

St. Louis

ST. LOUIS, MO., January 18, 1915.

Pig Iron.—The impression is gaining ground that the foundries are beginning to need the metal. Sales were all of 100 and 200-ton size with the exception of one of 3000 tons in the Peoria district. Inquiries pending are all for 200 tons and below.

Coke.—The coke market is bare of inquiries, but shipments on contract are reported up to the stipulated amounts. By-product coke is at the Connellsville basis plus \$2.80 freight rate.

Finished Iron and Steel.—The Oklahoma State Capitol bids requiring about 1800 tons of reinforcing material were rejected as too high. The Missouri, Kansas & Texas is reported in the market for 10 locomotives. The structural and bar activity is still in small individual quantities, but increasing in the aggregate. The price of 1.10c., Pittsburgh, is well maintained, and the buyers are making no complaint. There has been a little demand for light rails and the agricultural implement and wagon trade is quiet. Stock out of warehouse has been moving in a satisfactory way and prices have been well held. We quote for material out of warehouse as follows: Soft steel bars, 1.70c.; iron bars, 1.65c.; tank plate, 1.80c.; structural material, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.55c. Generally speaking, the feeling is optimistic, but the buying conservative.

Old Material.—The scrap market is strongly higher and the lists reported out last week went at considerably better prices than has been the case for a long time. The demand for steel is improving rapidly and there is also inquiry for rolling mill grades, but the individual transactions are continuing small because of the caution prevalent. We quote dealers' price f.o.b. St. Louis as follows:

Per Gross Ton	
Old iron rails	\$10.00 to \$10.25
Old steel rails, re-rolling.	10.25 to 10.50
Old steel rails, less than 3 feet.	11.50 to 12.00
Relaying rails, standard section, subject to inspection.	21.00 to 23.00
Old carwheels	10.25 to 10.50
No. 1 railroad heavy melting steel scrap	9.50 to 9.75
Shoveling steel	8.75 to 9.00
Frogs, switches and guards cut apart	9.75 to 10.00
Bundled sheet scrap	6.00 to 6.25
Per Net Ton	
Iron angle bars	\$10.75 to \$11.00
Steel angle bars	9.00 to 9.25
Iron car axles	15.00 to 15.50
Steel car axles	10.75 to 11.00
Wrought arch bars and transoms.	11.25 to 11.50
No. 1 railroad wrought.	8.25 to 8.50
No. 2 railroad wrought.	8.00 to 8.25
Railroad springs	8.75 to 9.00
Steel couplers and knuckles.	9.25 to 9.50
Locomotive tires, 42 in. and over, smooth inside	9.00 to 9.25
No. 1 dealers' forge.	7.50 to 7.75
Mixed borings	5.25 to 5.50
No. 1 bushelling	7.75 to 8.00
No. 1 boilers, cut to sheets and rings.	6.25 to 6.50
No. 1 railroad cast scrap.	9.50 to 10.00
Stove plate and light cast scrap.	8.00 to 8.25
Railroad malleable	7.25 to 7.50
Agricultural malleable	6.75 to 7.00
Pipes and flues	6.25 to 6.50
Railroad sheet and tank scrap.	6.25 to 6.50
Railroad grate bars	7.50 to 7.75
Machine shop turnings	5.75 to 6.00

Birmingham

BIRMINGHAM, ALA., January 18, 1915.

Pig Iron.—Sales have fallen off to small lots, with inquiries for larger consignments not brisk. The prevailing prices at which business is done range from \$9.50 to \$9.75 with the major portion on the former basis. The effort to advance, owing to the small business being done, has not yet materialized. Hold-up orders given during the late fall have not yet been released. Undoubtedly the principal cause of the continued low prices is the low ebb of iron consumption in the South. At the bottom of it all is cotton. Small Southern foundries are operating at a minimum, taking only so much of the iron ordered as can be melted at once. Southern makers report a much greater ease in effecting shipments to the North and Middle West than to non-

competitive territory. The effect has been to increase accumulations on Alabama yards, it being now reported in reliable quarters that the stock of all iron is nearing 500,000 tons. One producer has over 140,000 tons and another's accumulations, some of it in warrant, are reported as touching 100,000 tons. This is conclusive evidence of the stagnation in small foundry operations. Under the circumstances there is no danger of an increase in the comparatively small output now being made. Against these conditions the good ones are a fourth consecutive week of operations in all departments of the Tennessee Company's steel plant at Ensley, renewal of operations at the Bessemer rolling mills and extension of operations by some of the larger water and gas pipe concerns. Operations at wire mills do not suggest large shipments of accumulated stock to foreign countries. The greatest improvement has been in the consumption of basic iron. Southern iron operators are not prepared to predict when great changes for the better will come. We quote, per gross ton, f.o.b. cars, at Birmingham furnaces, as follows:

No. 1 foundry and soft.....	\$10.00 to \$10.25
No. 2 foundry and soft.....	9.50 to 9.75
No. 3 foundry.....	9.00 to 9.25
No. 4 foundry.....	8.75 to 9.00
Gray forge.....	8.50 to 8.75
Basic.....	9.50 to 10.00
Charcoal.....	22.50 to 23.00

Cast-Iron Pipe.—A number of satisfactory orders have been received by the pipe plants of the Birmingham district, and additional pits have been put on. There is a disposition to seek a stricter maintenance of quotations. The sanitary pipe business is reported as still on half time. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$20; 6-in. and upward, \$18, with \$1 additional for gas pipe.

Coal and Coke.—The bunker coal trade is a trifle better, but not yet near to normal conditions. Coke has sold fairly well, owing to the small output and the renewal of contracts. Renewals, however, have been on a cautious basis. We quote, per net ton, f.o.b. oven, as follows: Furnace coke, \$2.75 to \$3; foundry, \$3.15 to \$3.40.

Old Material.—The Southern scrap market has not reflected the betterment reported elsewhere. Owing to local conditions, business is still on a small basis and quoted prices are not always upheld. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles.....	\$13.00 to \$13.50
Old steel axles.....	12.50 to 13.00
Old iron rails.....	12.00 to 12.50
No. 1 railroad wrought.....	8.50 to 9.00
No. 2 railroad wrought.....	7.50 to 8.00
No. 1 country wrought.....	8.00 to 8.50
No. 2 country wrought.....	7.00 to 7.50
No. 1 machinery cast.....	9.50 to 10.00
No. 1 steel scrap.....	8.00 to 8.50
Tram carwheels.....	8.50 to 9.00
Stove plate.....	8.00 to 8.50

San Francisco

SAN FRANCISCO, CAL., January 12, 1915.

A distinctly better feeling is manifested by the business now being booked. Orders are more numerous, and in some instances larger than for some time, with indications of further improvement later in the month. Buyers have shown some anxiety to place contracts at the old prices, but have been unable to do so beyond the first quarter, and considerable business is said to have been turned down. Local resale prices also show an upward tendency. Fluctuating freight rates through the Panama Canal have caused some uncertainty and dissatisfaction. Several of the lines have announced a further advance, to 40c. per 100 lb. on bars, shapes, plates, etc., and the diversion of vessels to European trade has made it difficult to get steamer accommodations for Pacific coast shipments. The prospect of an early change in the rail rate also tends to keep the market unsettled.

Bars.—Some foreign material, shipped on sailing vessels before the war, is still coming in, but is no longer a factor of much importance in the market. New business has not been heavy, but merchants are

taking more interest, and show some inclination to increase their stocks. Jobbing trade is rather spotted, being fair in some quarters and very quiet in others. Building requirements are exceptionally light.

Structural Material.—A few important jobs are in prospect for spring, but no contracts worth mentioning have been placed. Figures have just been taken on a small building in Oakland, and bids will be taken February 1 for the Fresno normal school. Plans have been completed for a seven-story bank building at Sacramento. Contracting for plain material has been on a rather limited scale.

Plates.—A moderate resumption of activity is noted in pipe and tank work, with a few large orders and favorable prospects in connection with irrigation works. Contracts for the Oregon City pipe material have been placed with the Lukens Iron & Steel Company and the United States Steel Products Company. Additional tanks for the Shell Oil Company, requiring about 1000 tons, are still to be provided for. Bookings for first quarter delivery have been very fair, though the small distributive business is still rather slow, and merchants' specifications are limited.

Sheets.—The consuming demand for blue annealed sheets is picking up, and with stiffening prices there is a fairly general movement to cover first quarter requirements. In black and galvanized, current requirements are light, and the trade is disposed to hold off, though a good many small orders are coming out.

Wrought Pipe.—Another contract for about 1500 tons of the Shell oil refinery has been placed with J. H. Gilhuly, representing the Youngstown Sheet & Tube Company. No other important business has appeared. The movement in the plumbing trade is very slow throughout the Pacific States. The outlook is not considered entirely discouraging, though so far merchants have been buying only in a small way.

Cast-Iron Pipe.—Figures are being taken for about 120 tons for the Mare Island Navy Yard. Corporation buying is light, but several important municipal inquiries are expected in the near future.

Pig Iron.—A few small shipments from Gulf and Atlantic ports have arrived lately, and occasional sales of domestic iron are being made at private terms, but the movement is confined to narrow limits. Most melters are covered for some time to come and a considerable tonnage is held by importers. Foundry business is extremely dull, though a few casting contracts are being placed.

Coke.—Spot values remain uncertain, with practically no business under way at the moment. Most of the foundries are well provided for, and a heavy tonnage is piled in dealers' yards. English coke is offered to arrive at about \$12 per gross ton.

Old Material.—The scrap market shows little feature at present, though a much better demand is expected in the spring. Cast-iron scrap holds fairly steady at \$14 to \$16 per net ton, and finds some inquiry, though the movement is light at the moment. Steel melting scrap still receives little attention and quotations are hardly more than nominal.

The Dunham, Carrigan & Hayden Company, San Francisco, is having plans drawn for a four-story brick and steel warehouse at Townsend and Kansas streets, to cost about \$200,000. The new building will house the hardware department, and the steel stock will be moved to the corrugated iron building now used for hardware.

The Washington Steel & Iron Company, Seattle, Wash., through its secretary and treasurer, O. P. Moore, has announced its intention of operating a steel manufacturing plant at Leavenworth, using the known processes and discarding the Rothert method. The company owns two large bodies of ore near Leavenworth.

The contract for castings for the Santa Fé Railroad shops at Richmond, Cal., is reported let to the Judson Mfg. Company.

New York

NEW YORK, January 20, 1915

Pig Iron.—The inquiries from Elizabethport, N. J., and from a spiegel interest in eastern Pennsylvania, referred to last week, have not yet produced business. Together they amount to 3200 tons. The activity for which some in the trade have been looking is still in the future, though reports from foundries indicate somewhat better operation. New England buyers apparently carried over a good deal of iron into the new year, as practically nothing has developed in that direction. Pipe iron has furnished some business to eastern Pennsylvania furnaces, upward of 10,000 tons having been taken recently. Some inquiry for basic iron has come up, but no important sales are reported. The destruction of a portion of the Roebling plant at Trenton will cause some diminution for a time in the consumption of basic iron. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, \$14.45 to \$14.95; No. 2 X, \$14.20 to \$14.45; No. 2 plain, \$13.95 to \$14.20. Southern iron is nominally \$14.50 for No. 1 and \$14 to \$14.25 for No. 2.

Ferroalloys.—A new complication is injected into the ferromanganese embargo situation. Guarantees submitted from American consumers have been rejected by the British Government, which insists that if any of the alloy is shipped to this country it must not only be guaranteed that it is to be used for domestic consumption only, but also that no steel, whether made by the use of English or any other ferromanganese, will be shipped to an enemy's country or to one contiguous thereto, without passing through London. This further stipulation has met with decided disfavor here and is regarded as putting on the screws too tightly. No shipments of the alloy are noted nor are there any prospects of any to come soon. It is reported that one cargo of manganese ore was recently received at Baltimore and that two more are about to be discharged there, the three aggregating possibly 15,000 tons. This is in contrast with only about 1600 tons imported in November. Two of the three cargoes are said to come from India. There has been some activity in spiegeleisen. Ferromanganese is provisionally quoted at \$68, seaboard, while 50 per cent. ferro-silicon is selling at \$71 to \$73, Pittsburgh.

Finished Iron and Steel.—Manufacturers appear to be turning around slowly with the completion of their annual inventories and there has been a distinct lull in buying in all lines. It is accordingly felt that the next week or two will indicate something of the tendencies of the year. Meanwhile prices are held firm. In fact, there is a disposition to quote carefully; for example, the Pennsylvania Railroad's inquiry for 1915 bridge requirements is not looked on very favorably, because present low prices are expected for material which will be erected at times when it is firmly believed much better figures will be obtainable. There is nothing new to report in railroad car buying, except that last week the Interborough Rapid Transit Company, New York, sent out inquiries for 478 all-steel cars and bought 12 for the Steinway tunnel, New York, of the Pressed Steel Car Company. Some additional structural contracts have been placed but nothing new of importance has come into the market. The awards include 500 tons for the Lehigh & New England at Pen Argyl, to the American Bridge Company; 400 tons for the New York Dock Company, Brooklyn, to Lewis F. Shoemaker & Co.; 1500 tons for the Lehigh & Wilkes-Barre coal breaker to the Fort Pitt Bridge Works, and 400 tons for column cores for the Winchester Repeating Arms Company to be supplied to the Aberthaw Construction Company by the Levering & Garrigues Company. We quote mill shipments of steel bars, shapes and plates at 1.10c. to 1.15c., Pittsburgh, or 1.26c. to 1.31c., New York, and iron bars at 1.20c. to 1.25c., New York. From store we quote iron and steel bars at 1.80c. to 1.85c., New York, and plates and shapes at 1.85c. to 1.90c.

Cast-Iron Pipe.—In this immediate vicinity the only important municipal letting is that of Hawthorne, N. J., which will open bids January 29 on 2174 tons of 6 to 14 in. Much interest is taken in announcements of

large contracts to be placed in the West. Private buying continues exceptionally active. Seldom has the volume of this class of business been greater than at present. Manufacturers feel confident that prices must shortly be favorably affected. Carload lots of 6-in. are still to be had at \$20 to \$20.50 per net ton, tidewater.

Old Material.—Eastern consumers of steel scrap and rolling mill stock are still uninfluenced by the better conditions that have recently been prevailing in Western scrap markets. Transactions show no improvement as compared with last week. Quotations are as follows, per gross ton, New York:

Old girder and T rails for melting...	\$7.75 to	\$8.00
Heavy melting steel scrap.....	7.75 to	8.00
Relaying rails	19.00 to	19.50
Rerolling rails	8.50 to	9.00
Iron car axles	14.00 to	14.25
Steel car axles	10.75 to	11.00
No. 1 railroad wrought.....	9.25 to	9.75
Wrought-iron track scrap.....	8.75 to	9.25
No. 1 yard wrought, long.....	8.75 to	9.25
No. 1 yard wrought, short.....	7.75 to	8.00
Light iron	3.00 to	3.50
Cast borings	5.50 to	6.00
Wrought turnings	5.50 to	6.00
Wrought pipe	7.25 to	7.50
Carwheels	9.25 to	9.50
No. 1 heavy cast, broken up.....	9.75 to	10.25
Stove plate	7.50 to	8.00
Locomotive grate bars.....	6.25 to	6.75
Malleable cast	7.00 to	7.50

Boston

BOSTON, MASS., January 18, 1915.

Old Material.—Dealers here are watching sharply developments in the steel situation. The recent improvement in the Pittsburgh district has had no local effect as yet, but conditions in eastern Pennsylvania have helped a little, stiffening the market somewhat. Prices have not been changed in the New England territory in the last fortnight. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	\$8.25 to	\$8.50
Low phosphorus steel	13.75 to	14.75
Old steel axles	12.75 to	13.25
Old iron axles	20.25 to	20.75
Mixed shafting	12.00 to	12.25
No. 1 wrought and soft steel.....	8.25 to	8.75
Skeleton (bundled)	5.50 to	5.75
Wrought-iron pipe	7.00 to	7.50
Cotton ties (bundled)	5.25 to	5.75
No. 2 light	3.25 to	3.75
Wrought turnings	5.00 to	5.50
Cast borings	5.00 to	5.25
Machinery cast	10.75 to	11.00
Malleable	7.50 to	7.75
Stove plate	7.00 to	7.50
Grate bars	5.25 to	5.50

Marked Advances in British Prices

High Ocean Freights Affecting Pig Iron — Shortage of Labor in Steel Works

(By Cable)

LONDON, ENGLAND, January 20, 1915.

Markets are excited and rather wild for pig iron, the ore position being very perilous, with 15s. (\$3.65) paid for freight from Bilbao to Middlesbrough. As a result hematite pig iron is quoted from 90s. to 100s., against 80s. last week. Ferromanganese is quoted £13 (\$63.26), f.o.b. works. Steel makers are becoming fidgety and the root of the trouble is absence of men owing to the war. If reasonable facilities were available for discharging vessels much of the stringency would disappear. The tone is strong all around, with more business appearing. Most works are running at utmost capacity based on the shortage in labor.

America has sold some tin plates to Denmark. The Welsh trade is still dormant, owing to export prohibitions. The Broken Hill Proprietary Steel Works, Newcastle, Australia, has booked 2500 tons of rails for New South Wales. Active furnaces in the three principal dis-

tricts are 165, against 162 a year ago. Stocks of pig iron in Connal's store are 114,636 tons, against 112,376 tons last week. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 13s. 3d. (\$3.22), against 13s. (\$3.16) last week.

Cleveland pig-iron warrants, 56s. 9d. (\$13.79), against 54s. 10d. (\$13.34) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 57s. (\$13.86), against 55s. 6d. (\$13.51) last week.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 (\$43.79), against £8 17s. 6d. (\$43.19) a week ago.

Steel ship plates, Scotch, delivered local yards, £8 (\$39.93), against £7 5s. (\$35.28) a week ago.

Steel rails, export, f.o.b. works port, £6 7s. 6d. (\$31.02), but some works decline quoting £6 12s. 6d. (\$32.23).

Hematite pig iron, f.o.b. Tees, 90s. to 100s., nominal, (\$21.87 to \$24.30), against 80s. (\$19.47) last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £5 10s. (\$26.76), against £5 7s. 6d. (\$26.15) last week.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £7 15s. (\$37.71), against £7 10s. (\$36.49) last week.

Steel bars, export, f.o.b. Clyde, £7 12s. 6d. (\$37.10).

Market is Stronger—Hematite Soaring—Vessels and Labor Very Scarce

(By Mail)

LONDON, January 8, 1915.—The position of the iron and steel markets strengthens and prices again mark a more or less substantial advance in most directions. The situation as regards Cleveland iron appears to be the subject of much interest and confidence on the part of the trade, even though the volume of new buying be comparatively poor. At the same time it must not be overlooked that the production has been greatly affected by the withdrawal of workmen from the furnaces, and it is hardly possible for the output to be increased to any substantial extent.

Looking over the past year it is found that the lowest point of No. 3 Cleveland, the index grade of iron, was reached in October at 48s. 3d. (\$11.74), while the top figure was recorded on the last day of the year and was 54s. 4½d. (\$13.23). The latter portion of 1914 was a period of advancing prices and the new year has opened in a firm mood, further advances being recorded. The price is now higher than it has been since September, 1913, and the conditions are such that almost anything may happen.

Hematite iron has at last felt the full force of the stringent conditions which have been gradually creeping over the market. This week East Coast descriptions have been put up to 80s. (\$19.47) a ton, and it is quite possible that the price will go higher. Steel naturally has been closely affected by the move in raw materials, and an advance of 5s. (\$1.22) a ton is recorded this week in several classes of material, notably joists. Works are now in many cases so full on their limited capacity basis that they are refusing to contract ahead and will merely sell for nearby delivery, and only moderate tonnages at that.

LABOR FAMINE SERIOUS

While much is heard of the shortage of ore and of shipping, and while to no small extent the present position here arises from such shortage, the underlying trouble is the labor famine. We have but few men available to handle traffic either on the railroads or at the wharves. At present there is not a single empty berth for ships in the port of London, and a string of ocean liners is waiting to get a vacant berth in the docks. Not only so, but big liners from the East are now waiting in Falmouth for room in London. Vessels have been diverted to Glasgow and elsewhere in the vain effort to get their cargoes discharged. Thousands and thousands of dock laborers are in French ports unloading transports, and thousands of the men left here are engaged loading transports and troopers. Indeed the movement of troops and the supply of their needs abroad is quite enough to keep all available labor in London hard at it, and when this is remem-

bered the congestion becomes understandable. There is no chance of things getting better until there are men to handle vessels as they come in. It would be well for people in America to bear this in mind.

Freights are excessive. Yesterday 40s. (\$9.73) and 10 per cent. was paid per ton of spelter from New York to Liverpool. This simply stops all business in steel and such like products.

Metal Market

NEW YORK, January 20, 1915.

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York		Electro-lytic New York		Tin, New York		Lead, New York	
Jan.	Lake	Jan.	Lake	Jan.	Lake	Jan.	Lake
13.....	13.87½	13.62½	33.60	3.70	3.50	6.05	5.90
14.....	13.87½	13.62½	33.60	3.70	3.50	6.10	5.95
15.....	13.87½	13.75	33.30	3.70	3.50	6.10	5.95
16.....	13.87½	13.75	33.50	3.70	3.50	6.10	5.95
18.....	13.87½	13.75	33.87½	3.70	3.50	6.20	6.05
19.....	14.00	13.87½	33.85	3.70	3.50	6.25	6.10

Export sales have caused copper to advance. Tin is higher but extremely dull. Lead is weak. Spelter has advanced with the continued foreign demand. Antimony is not plentiful and is higher.

New York

Copper.—It is agreed on every side that the domestic demand for electrolytic copper is light. Prices have advanced, however, and the quotation yesterday was 13.87½c., 30 days delivered, with some interests holding for ¼c. higher. The strength of the market is entirely attributed to the demand from abroad. It is reported that in the week Russia bought 25,000,000 lb. and no one sees any reason to doubt the statement. United States Government figures show that the exports in the week ended January 9 amounted to 16,884,783 lb., which is at the rate of about 70,000,000 lb. per month. Lake copper, which is quoted at 14c., cash, or more, has been in good demand either directly or indirectly for export to satisfy the needs of the warring nations. The export demand for Lake has done much to compensate its producers for the losses they sustained from the big strike and other troubles of recent months.

Tin.—The market has been quiet and unsatisfactory almost without abatement. On January 14 one interest endeavored to start buying by offering the metal at 33c., but buyers were suspicious and the effort failed to induce business. The following day there was somewhat better inquiry but no notable action followed, and on January 18 indifference had set in again. Yesterday the market was dull with consumers taking spot and nearby in small lots only. The indications are that the February supply will be excessive as some large arrivals are scheduled for this month. On the Ghazee, due at Boston January 19, from Singapore and Penang, is 625 tons. On the St. Fillans, from Singapore, due January 26, is 500 tons and on the Minnewaska from London, due January 25, is 725 tons. The total afloat is 3940 tons. The arrivals this month amount to 1310 tons. The amount of Banca tin stored in Holland December 31 was 3886 tons. It is now understood that no tin is being sent into Germany from Holland. The price yesterday was 33.85c.

Lead.—About the only bright spot in the situation is that presented by the large exports which in 11 months of 1914 amounted to 49,482 tons. The reduction in price noted a week ago did not stimulate the market. There is some inquiry for March, April, May and June delivery, but sellers are reluctant to make commitments for so far ahead. The New York quotation is 3.70c. and that at St. Louis, 3.50c. and the market is weak at these quotations.

Spelter.—Based on foreign demand the market is strong at 6.10c., St. Louis, and 6.25c., New York. Aside from the exports of spelter in crude form, the higher grades such as brass mill special, are in good demand for ultimate exportation in brass products, such as cartridge metal. Ordinarily brass mill special runs about

$\frac{1}{4}$ c. over ordinary brands, but to-day it is $\frac{3}{4}$ c. or more higher. In fact, some grades command 11c. and 11 $\frac{1}{4}$ c.

Antimony.—England has placed an embargo on the exportation of antimony and this, with the good demand from abroad, has given great strength to the market. No quotations on future Chinese and Japanese are obtainable, Russia having absorbed that supply. Cookson's is quoted at 18c., Hallett's at 17c., and Hungarian or miscellaneous brands at 16c.

Old Metals.—The market continues strong. Dealers' selling prices, which are unchanged, are as follows:

	Cents per lb.
Copper, heavy and crucible.....	12.75 to 13.00
Copper, heavy and wire.....	12.25 to 12.50
Copper, light and bottoms.....	11.25 to 11.50
Brass, heavy.....	9.00 to 9.25
Brass, light.....	7.25 to 7.50
Heavy machine composition.....	11.25 to 11.50
Clean brass turnings.....	8.50 to 8.75
Composition turnings.....	9.75 to 10.00
Lead, heavy.....	3.45
Lead, tea.....	3.20
Zinc, scrap.....	4.50

Chicago

JANUARY 18.—The copper market has been active, with a steady strengthening of prices. Producers are limiting the tonnages accepted for future delivery. Lead prices were reduced 10c. per 100 lb. and by way of contrast spelter advanced. Quotations are as follows: Casting copper, 13.50c. to 13.75c.; Lake copper, 13.75c. to 14c., for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{1}{4}$ c. higher; pig tin, carloads, 34.50c.; small lots, 37.50c.; lead, desilverized, 3.57 $\frac{1}{2}$ c., and corroding, 3.75c., for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 6.10c.; sheet zinc, 8.75c.; Cookson's antimony, 18c. to 20c., for cask lots; other grades, 15c. to 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.50c.; copper clips, 10.50c.; red brass, 10c.; yellow brass, 7.50c.; lead pipe, 3c.; zinc, 4c.; pewter, No. 1, 26c.; tinfoil, 31c.; block tin pipe, 30c.

St. Louis

JANUARY 18.—The non-ferrous metals have been quite firm, with spelter in rather an excited state, the quotations having a wide range. The close to-day for spelter was at 5.75c. to 5.90c. with some sales, but a tendency manifest to wait for a settling down of the market. Lead closed at 3.50c.; tin, 35.50c.; lake copper, 14c.; electrolytic copper, 13.90c.; Cookson's antimony, 17c. In the Joplin ore market zinc blende commanded the highest price in years with the range from \$49 to \$53.50 per ton for 60 per cent. ore, with the choicest lots as high as \$56.50 per ton. Calamine ranged from \$21 to \$28 per ton for 40 per cent. and the top price for premium grades was \$35 per ton. Lead ore was steady at \$47 per ton. Miscellaneous scrap metals we quote as follows: Light brass, 5c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8c.; heavy copper and copper wire, 9c.; tea lead, 3c.; zinc, 3c.; pewter, 20c.; tinfoil, 25c.; lead, 3c.

Hickman, Williams & Co. to Sell Canadian Iron

Hickman, Williams & Co. have been appointed exclusive agents by the Algoma Steel Corporation, Sault Ste. Marie, Ont., for the sale of its surplus pig iron in the foundry market. The company operates three blast furnaces, two of 250 tons capacity daily and one, at present out of blast, of 500 tons. In connection with this plan to enter the merchant pig-iron market, the ores mined by this company are to be brought up to suitable grade for the making of malleable and gray iron, as well as Bessemer and basic iron.

The Efficiency Society, Inc., will hold its annual meeting at the Hotel Biltmore, New York City, January 25. The business meeting for election of officers will be held in the morning. For the afternoon a conference is scheduled on "Welfare and Unemployment." A banquet is to be held in the evening with addresses on the work of the United States Navy.

Iron and Industrial Stocks

NEW YORK, January 20, 1915

The stock market continues its upward movement. Developments of a favorable character overbalance those unfavorable. The advance in Bethlehem stocks is now explained by the declaration of a full 7 per cent. dividend on the preferred. The announcement of an extraordinarily favorable balance of trade in the December imports and exports has also aided the situation, as showing a decided improvement in international exchange. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	8 $\frac{1}{4}$ - 11	Nat. En. & St.,	
Allis-Chal., pref..	35 - 37	pref.....	79
Am. Can., com..	29 $\frac{1}{4}$ - 31 $\frac{1}{4}$	Pressed St'l, com.	35 - 36 $\frac{1}{2}$
Am. Can., pref..	93 $\frac{3}{4}$ - 96	Pressed St'l, pref.	101 - 101 $\frac{1}{2}$
Am. Car & Fdy.,		Ry. Spring, com.	24 $\frac{1}{2}$ - 25
com.....	46 $\frac{1}{2}$ - 48 $\frac{1}{2}$	Republic, com..	20 $\frac{1}{2}$ - 22 $\frac{1}{2}$
Am. Loco., com..	27 $\frac{1}{4}$ - 28 $\frac{1}{2}$	Republic, pref..	76 - 78
Am. Loco., pref..	96	Rumely Co., com.	11 $\frac{1}{2}$ - 12 $\frac{1}{2}$
Am. Steel Fdries.	31 - 32	Rumely Co., pref.	12
Bald. Loco., com.	39 - 40	Stoss, com.....	27
Bald. Loco., pref.	102 $\frac{1}{2}$ - 103 $\frac{1}{2}$	Pipe, com.....	9 $\frac{1}{2}$ - 10
Beth. Steel, com.	51 $\frac{1}{4}$ - 54 $\frac{3}{4}$	U. S. Steel, com..	50 $\frac{3}{4}$ - 52 $\frac{3}{4}$
Beth. Steel, pref.	97 - 101	U. S. Steel, pref.	107 $\frac{3}{4}$ - 108 $\frac{3}{4}$
Colorado Fuel...	23 $\frac{3}{4}$ - 25 $\frac{3}{4}$	West'gh'se Elec.	70 $\frac{3}{4}$ - 71 $\frac{3}{4}$
General Electric.	143 $\frac{1}{2}$ - 145 $\frac{1}{4}$	Chic. Pneu. Tool.	52 $\frac{3}{4}$ - 53 $\frac{1}{2}$
Gt. N. Ore Cert..	27 $\frac{1}{2}$ - 30 $\frac{1}{4}$	Cambria Steel...	44 $\frac{1}{2}$ - 45
Int. Harv., com.....	98 $\frac{1}{4}$	Warwick.....	9 $\frac{1}{4}$
Int. Harv., new.....	117	Cruc. Steel, com.	14 $\frac{1}{4}$ - 14 $\frac{3}{4}$
Int. Harv., Corp.....	73	Cruc. Steel, pref.	81 - 81 $\frac{1}{2}$
Int. Harv., Corp., pref.	114	Harb. Wk. Ref., com.	48
Int. Pump, com.....	5 $\frac{1}{4}$	Harb. Wk. Ref., pref.	99
Nat. En. & St.,		La Belle Iron,	
com.....	11 - 12 $\frac{1}{2}$	com.....	28 $\frac{3}{4}$ - 30
		La Belle Iron, pref.	109 $\frac{1}{4}$

Dividends

The Bethlehem Steel Company, 7 per cent. on the preferred stock, payable in quarterly installments of 1 $\frac{3}{4}$ per cent. each.

The International Harvester Corporation has again passed the quarterly dividend of 1 $\frac{1}{4}$ per cent. on the common stock. The company states that, as a large part of its business is with European nations now at war, conditions are in no way improved, so that it has been considered advisable to pass the dividend.

The Willys-Overland Company, regular quarterly, 1 $\frac{1}{2}$ per cent. on the common stock, payable February 2.

Receiver for the M. Rumely Company

Application for a receiver for the M. Rumely Company, agricultural machinery manufacturer, La Porte, Ind., was made January 19 in the United States District Court, Indianapolis, by company interests. The petition was granted, the court appointing as receiver Finley P. Mount, an attorney of Indianapolis. Mr. Mount's bond was fixed at \$50,000, and he was instructed by the court to continue the operation of the plant. The appointment of the receiver was made on a showing that the company was unable to meet obligations matured and maturing. The creditors had asked that Clarence S. Funk, of Chicago, president of the company, and Stephen B. Fleming, of Fort Wayne, Ind., be named joint receivers.

Midvale Steel Company's Report

The annual report of the Midvale Steel Company for the fiscal year ended October 31, 1914, shows net profits of \$416,988, against \$767,931 the previous year, a decrease of \$350,943. Dividends paid the last fiscal year aggregated \$268,125, at the rate of 2 $\frac{1}{2}$ per cent. on \$9,750,000 capital stock, compared with \$390,000, or 6 per cent. paid in the fiscal year 1913, and \$585,000, or 6 per cent., in 1912.

Eridge and Other Structural Contracts

At the monthly meeting of the Bridge Builders and Structural Society held in New York January 15, it was shown from careful reports collected by its secretary that during the month of December 35 per cent. of the entire capacity of the bridge and structural shops of the country was contracted for.

German Iron and Metal Trades

The pig-iron demand from neutral countries was larger in December than in November. Sales for the first quarter of 1915 are active and satisfactory.

Basic steel bars are held at \$28.71 for quick delivery, time deliveries going at \$25.55 to \$25.79. Demand for bar iron, especially horseshoe and rivet iron, is considerable. Common merchant bars are now \$34.79 to \$37.23 for horseshoe iron. Light sheets are firmer at \$30.42 to \$32.36, with medium gauges at \$28.71 to \$29.70, the demand being good for military purposes.

The heavy production of plates depresses the market. Common plates are now \$25.79 to \$26.28, and boiler plates \$28.71 to \$29.20. Orders for plates from Sweden and Denmark are reported brisk at prices higher than domestic.

Tube makers, who recently advanced prices by \$3.65 to \$4.87 per ton, are operating now at only about 33 per cent. of capacity. The hoop iron association has advanced prices \$1.22 per ton to \$32.85, with demand good. Wire rods are down to \$25.79 to \$26.28, with sales at lower prices rumored. Wire nails are selling at \$32.24 to \$32.85. Steel foundries are busy at remunerative prices. The Association of Malleable Iron Foundries has advanced prices \$12.17 per ton.

Upper Silesian reports are optimistic, but the southwestern market is dull, with most plants operating only 50 per cent. In Upper Silesia and Westphalia most producers have changed over to the manufacture of war materials with surprising elasticity.

Lead demand is stronger. Though stocks have decreased the quantity available is reported sufficient to keep plants in operation. Silesian raw lead is \$6.09 to \$6.33 per cwt. for large lots delivered, with rolled and pressed lead at \$7.66 to \$7.91 per cwt. f.o.b.

The Association of Metal Merchants, 75 firms, has asked the Imperial Home Office to allow, in connection with the recent fixing of maximum prices for metals, a commission of 2½ per cent. for new metals and up to 5 per cent. for old and waste metals.

German Steel Syndicate's Output

The German Steel Works Union has only recently given out its output for the months following the outbreak of the war. As published in *Stahl und Eisen*, December 24, the falling off caused by the war, as compared with the average for the seven months preceding, is shown by the following in metric tons:

	Semi-finished steel	Rail material	Shapes	Totals
1914				
Average for 7 months....	136,419	214,397	163,316	514,132
August	15,165	61,360	18,429	94,954
September	36,748	150,741	57,705	245,194
October	46,023	153,973	74,574	280,570
November	38,717	149,911	57,460	246,088

Semi-finished steel and shapes show a decided decline; also all three classes fell off in November from the October totals.

The Atlantic Screw Works, Inc., is a new corporation at Hartford, Conn., which has taken over the plant of Fred N. Tilton. Mr. Tilton has associated with himself several prominent business men, remaining as president and treasurer. The vice-president and general sales manager is A. W. Bowman; secretary, Morton F. Miner. Other directors than those mentioned are Charles D. Rice, Samuel M. Stone, Leon P. Broadhurst and S. S. Chamberlin. The company will continue the manufacture of wood screws of every description, including screws of brass and bronze.

The Illinois Metals Company, Plano, Ill., at its annual meeting elected the following officers: J. P. Burke, president; George Cormack, vice-president; W. M. Foster, treasurer; J. P. Donahue, secretary. The company enjoyed a very satisfactory year of business, despite the general depression.

A profit-sharing system inaugurated by the United Steel Company, Canton, Ohio, in 1914, resulted in the distribution a few days ago of bonuses to 475 men, or to about one-half of the employees, the amount of bonus being based on the earnings and length of service.

British Exports of Steel for 1914

Great Britain's iron and steel exports for 1914 show a decrease both in tonnage and values from 1913, the decrease antedating the war. The total sent abroad for the year 1914, excluding iron ore and scrap, was 3,888,907 gross tons against 4,933,704 tons for 1913, a decrease of 1,044,797 tons. The falling off in values was £12,572,346 or from £54,291,768 to £41,719,422 for the year. In pig iron the decrease in exports was 276,360 tons, the total for 1914 being 668,902 tons, against 945,262 tons for 1913.

Exports of ferromanganese in December were only 567 gross tons as compared with about 9000 tons in December, 1913, the full effect of the embargo being felt. Exports of ferromanganese for 1914 were about 111,000 gross tons against about 178,000 tons for 1913, a decrease of about 67,000 tons. The exports of galvanized sheets were 556,601 tons or 195,474 tons less than for 1913.

Imports of iron and steel, excluding iron ore and scrap, for 1914 were 1,616,693 gross tons against 2,220,366 tons for 1913, a decrease of 603,673 tons. The values for these two years were £10,865,140 and £15,231,633 respectively, a decrease in imports of £4,366,493. Imports of iron ore for 1914 were 5,704,883 gross tons against 7,442,749 tons in 1913 and 6,602,000 tons in 1912.

Commenting editorially on the statistics the London Iron and Coal Trades Review says: "Bearing in mind the limitations caused by the war they show that, exclusive of scrap, our exports of iron and steel in 1914 were 3,889,000 gross tons, as against 4,933,000 tons in 1913. Taking the actual exports during the five months of the war and averaging them over a year we obtain a rate of 2,750,000 tons per annum, or a falling off compared with the annual rate of the first seven months before the war of 1,850,000 tons per annum. So far as values are concerned our exports of iron and steel and manufactures thereof in 1914 were valued at £41,719,000, as against £54,292,000 in 1913."

National Scrap Iron and Steel Association

CHICAGO, ILL., January 20, 1915—(By Telegraph.)—The National Scrap Iron and Steel Association held its annual meeting at the Hotel La Salle Tuesday, January 19, followed by its first annual banquet. The officers elected for the ensuing year are as follows: W. K. Kenly, Merchants' Steel & Supply Company, president; R. D. Cohen, vice-president; Joseph L. Liebermann, treasurer; Fred Mayer, secretary; C. H. Lipschitz, associate secretary.

The National Association now includes two divisions—the Western and Central. Of the former, Moses Lieberman was chosen vice-president and of the latter E. A. Schwarzenberg. The work of the association in the past year has been largely one of organization, the principal accomplishment being the creation of the Central Division. For 1915 the establishment of an Eastern Division will be the object of first importance.

Aside from the election of officers the annual meeting was devoted almost entirely to modifications of the constitution and by-laws to provide for the new and larger needs of the organization, of which there are now 66 members.

The banquet in the evening was well attended and tastefully appointed. The principal speaker was Judge Marcus Kavanaugh, who urged upon this association as a new organization the seeking after ideals in business. Burton L. Verner, the first and retiring secretary of the association, was elected an honorary member and at the banquet was presented with a handsome ring in appreciation of his services.

The New Jersey Wire Cloth Company, whose main office is in Trenton, N. J., was not in any way affected by the fire which destroyed some of the Trenton buildings of the John A. Roebling's Sons Company, January 19. Part of these buildings were formerly occupied by the New Jersey Wire Cloth Company, but were vacated about a year ago with the removal of the wire cloth works to Roebling, N. J.

Code for the Use of Abrasive Wheels

Leading Features of a Safety Code Drawn Up by Abrasive Wheel Manufacturers and Covering Parts of Grinding Machines Related Thereto

Recognizing the lack of appreciation among many users of abrasive wheels, and among officials of State labor departments and State factory inspectors, of the important factors bearing on safety in connection with abrasive wheels, the abrasive wheel manufacturers appointed a committee to draft a code for safe practises in relation to abrasive wheels. This code is to be used as the foundation of a campaign for uniform State laws and uniform insurance rules in an endeavor to overcome present and prevent future unsafe practises, and also to eliminate much of the confusion existing at present brought about from the lack of uniformity in State and insurance requirements.

The report of a special committee appointed by the National Machine Tool Builders' Association, printed at length in these columns, May 14, 1914, to consider safety in connection with abrasive wheels and grinding machines, and a tentative report of a special committee appointed by the State of Pennsylvania to draft laws pertaining to grinding and polishing, were used as a basis of consideration for the code which has been drawn up and which has been approved by the following abrasive wheel manufacturers.

Abrasive Material Company, Philadelphia.
American Emery Wheel Works, Providence, R. I.
Bridgeport Safety Emery Wheel Company, Bridgeport, Conn.
Carborundum Company, Niagara Falls, N. Y.
Canadian-Hart Grinding Wheel Company, Hamilton, Ont.
Commercial Corundum & Emery Wheel Company, Chicago.
Cortland Corundum Wheel Company, Cortland, N. Y.
Dayton Grinding Wheel Company, Dayton, Ohio.
Detroit Grinding Wheel Company, Detroit.
Dominion Abrasive Wheel Company, Toronto, Ont.
Hampden Corundum Wheel Company, Springfield, Mass.
Manhattan Rubber Mfg. Company, New York City.
National Corundum Wheel Company, Buffalo, N. Y.
New York Belting & Packing Company, New York City.
Norton Company, Worcester, Mass.
Pittsburgh Emery Wheel Company, Pittsburgh.
Safety Emery Wheel Company, Springfield, Ohio.
Springfield Mfg. Company, Bridgeport, Conn.
Star Corundum Wheel Company, Detroit.
Sterling Grinding Wheel Company, Tiffin, Ohio.
Superior Corundum Wheel Company, Waltham, Mass.
Vitrified Wheel Company, Westfield, Mass.
Waltham Emery Wheel Company, Waltham, Mass.

Abrasive wheel manufacturers recommend three general types of safety devices to be used for grinding wheels, namely, protection flanges, protection hoods and protection chucks. It will be impracticable to print the code at length, but the following, pending its printing and distribution, will indicate the main stipulations. It may be mentioned that the National Machine Tool Builders' Association has approved the code.

PROTECTION FLANGES

The abrasive wheel manufacturers recommend protection flanges of the double or single concave type, used in conjunction with wheels having double or single convex tapered sides or side.

New installations of protection flanges for double tapered wheels shall have a taper of not less than $\frac{3}{4}$ in. to the foot for each flange. New installations of protection flanges for single tapered wheels shall have a taper of not less than $\frac{3}{4}$ in. to the foot.

Each flange, whether straight or tapered, shall be relieved or recessed at the center at least $\frac{1}{16}$ in. on the side next to the wheel for a distance as specified in the table of dimensions.

All tapered flanges over 10 in. in diameter shall

be of steel or material of equal strength. Tapered flanges 10 in. and smaller in diameter may be made of cast iron. Both flanges in contact with the wheels shall be of the same diameter.

Dimensions in Inches of Tapered Flanges and Tapered Wheels Where Hoods Are Not Used in Conjunction Therewith.

	A—Maximum flat spot at center of flange.					
	B—Flat spot at center of wheel.					
	C—Minimum diameter of flange.					
	D—Minimum thickness of flange at bore.					
	E—Minimum diameter of recess in taper flanges.					
	F—Minimum thickness of each flange for single taper at bore.					
Diameter of Wheel	A	B	C	D	E	F
6.....	0	1	3	$\frac{3}{8}$	2	$\frac{3}{8}$
8.....	0	1	5	$\frac{3}{8}$	$3\frac{1}{2}$	$\frac{3}{8}$
10.....	0	2	6	$\frac{1}{2}$	4	$\frac{1}{2}$
12.....	4	$4\frac{1}{2}$	6	$\frac{5}{8}$	4	$\frac{5}{8}$
14.....	4	$4\frac{1}{2}$	8	$\frac{5}{8}$	$5\frac{1}{2}$	$\frac{5}{8}$
16.....	4	6	10	$\frac{5}{8}$	7	$\frac{5}{8}$
18.....	4	6	12	$\frac{5}{8}$	8	1
20.....	4	6	14	$\frac{5}{8}$	9	1
22.....	4	6	16	$\frac{5}{8}$	$10\frac{1}{2}$	$1\frac{1}{8}$
24.....	4	6	18	$\frac{5}{8}$	12	$1\frac{1}{8}$
26.....	4	6	20	$\frac{5}{8}$	$13\frac{1}{2}$	$1\frac{1}{8}$
28.....	4	6	22	$\frac{7}{8}$	$14\frac{1}{2}$	$1\frac{1}{8}$
30.....	4	6	24	$\frac{7}{8}$	16	$1\frac{1}{8}$

PROTECTION HOODS

Protection hoods shall always be used where practical with wheels not provided with protection flanges. Hoods shall be designed and constructed of a material sufficiently strong to retain all pieces of a broken grinding wheel. Hoods shall conform as nearly as possible to the periphery of the wheel, and shall be designed to leave exposed the least portion of the wheel compatible with the work, and shall be of the adjustable type or provided with a sliding tongue or similar device, or a method of contracting the rim, for the purpose of closing the opening in the hood as the wheel is reduced in diameter, to afford maximum protection at all times. Protruding ends of the wheel arbors and their nuts shall be guarded.

Cups, cylinders and sectional ring wheel shall be either protected with hoods, or inclosed in protection chucks, or surrounded with protection bands. Not more than one-quarter of the height of such grinding wheels shall protrude beyond the provided protection.

GENERAL SAFETY REQUIREMENTS

Before mounting, all wheels shall be closely inspected to make sure that they have not been injured in transit, storage or otherwise. For added precaution wheels other than of the elastic and vulcanite type should be tapped lightly with a hammer; if they do not ring with a clear tone they should not be used. Damp wheels when tapped with a hammer may not give a clear tone. Wheels must be dry and free from sawdust when applying this test.

Grinding wheels shall fit freely on the spindles, they shall not be forced on nor shall they be too loose. Wheel arbor holes shall be made 0.005 in. larger than the machine arbor. The soft metal bushing shall not extend beyond the sides of the wheel at the center.

Ends of spindles shall be threaded left and right so that the nuts on both ends will tend to tighten as the spindles revolve. Care should be taken in setting up machines that the spindles are arranged to revolve in the proper direction, else the nuts on the ends will loosen.

Straight Flanges and Straight Wheels Used with Protection Hoods.

Diameter of wheel, in.	Minimum outside diameter of flange, in.	Minimum diameter of recess, in.	Minimum thickness of flange at bore, in.
6	2	1	$\frac{3}{8}$
8	3	2	$\frac{3}{8}$
10	$3\frac{1}{2}$	$2\frac{1}{4}$	$\frac{3}{8}$
12	4	$2\frac{3}{4}$	$\frac{1}{2}$
14	$4\frac{1}{2}$	3	$\frac{1}{2}$
16	$5\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{2}$
18	6	4	$\frac{5}{8}$
20	7	$4\frac{1}{2}$	$\frac{5}{8}$
22	$7\frac{1}{2}$	5	$\frac{5}{8}$
24	8	$5\frac{1}{2}$	$\frac{5}{8}$
26	$8\frac{1}{2}$	6	$\frac{5}{8}$
28	10	7	$\frac{5}{8}$
30	10	7	$\frac{5}{8}$

Wheels shall never be run without flanges. Both flanges in contact with the wheels shall be of the same diameter whether straight or tapered. Wheel washers of compressible material, such as blotting paper, rubber or leather, not thicker than approxi-

closed in a locked case, or some device shall be used which prevents motor from being run at too high speeds.

No user of wheels shall use on any given machine a wheel of larger diameter or greater thickness than specified by the machine builder.

If wheels become out of balance through wear and cannot be balanced by truing or dressing, they should be removed from the machine.

A wheel used in wet grinding shall not be allowed to stand partly immersed in the water. Water-soaked portion may throw the wheel dangerously out of balance.

Wheel dressers should be equipped with rigid sheet metal or other guards over the tops of the cutters, to protect operator from flying pieces of broken cutters.

Minimum Sizes of Machine Spindles in Inches for Various Diameters and Thickness of Grinding Wheels.

Dia. in.	Thickness of Wheel in Inches															
	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
6	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
8	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
10	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
12	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
14	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
16	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
18	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
20	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
22	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
24	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
26	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
28	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
30	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5
36	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	5

mately 0.025 in., shall be fitted between the wheel and its flanges. It is recommended that the wheel washers be slightly larger than the diameter of the flanges used.

When tightening clamping nuts, care shall be taken to tighten same only enough to hold the wheel firmly, otherwise the clamping strain is apt to crack the wheel. Flanges, whether straight or tapered, must be frequently inspected to guard against the use of flanges which have become bent or sprung out of true, or out of balance. If a tapered wheel has broken, the tapered flanges must be carefully inspected for truth before using with a new wheel. Clamping nuts shall also be inspected.

A speed of 5000 peripheral feet per minute is recommended as the standard operating speed for vitrified and silicate straight wheels, tapered wheels and shapes other than those known as cup and cylinder wheels, which are used on bench floor, swing frame and other machines for rough grinding. Speeds exceeding 5000 ft. may be used upon recommendation of the wheel manufacturer, but in no case shall a speed of 6500 peripheral feet per minute be exceeded.

A speed of 4500 peripheral feet per minute is recommended as standard operating speed for vitrified and silicate wheels of the cup and cylinder shape, used on bench, floor, swing frame and other machines for rough grinding. Speeds exceeding 4500 peripheral feet per minute may be used upon recommendation of the wheel manufacturer, but in no case shall 5500 peripheral feet per minute be exceeded.

For elastic, vulcanite and wheels of other organic bonds, the recommendations of individual wheel manufacturers shall be followed.

For precision grinding an operating speed of 6500 peripheral feet per minute may be recommended. Speeds higher than 6500 peripheral feet per minute can be used only upon recommendation of the wheel manufacturer.

If a wheel spindle is driven by a variable-speed motor, the speed control of the motor shall be in-

Goggles shall be provided for use of grinding wheel operators where there is danger of eye injury. They should be readily accessible, or better, should be the individual property of the operator. Where this is not done, men should be urged to wash their faces immediately before and after using the goggles.

Grinding rooms shall not only be well ventilated and well lighted, but kept warm and dry; machines shall be attached to a dust-exhausting system. Besides protection to the workmen, the dust-exhausting system prevents wear and tear on machinery and belts.

Work shall not be forced against a cold wheel, but work applied gradually, giving the wheel an opportunity to warm and thereby eliminate possible breakage. This applies to starting work in the morning in grinding rooms which are not heated in winter and new wheels which have been stored in a cold place.

PRECAUTIONARY SUGGESTIONS

Cone pulleys determining the speed of a wheel should never be used unless belt-locking devices are provided.

The maximum size of wheel which should be used with given operating speeds should be indicated on each machine.

Grinding machines should be provided with a stop or some method of fixing the maximum size of wheel which may be used, at the speed at which the wheel spindle is running.

For protection against flying chips, etc., plate glass in metal frames can be placed just above the grinding spaces of the wheels. Where it is impracticable or undesirable to use a glass shield, a leather flap may be attached to the hood and adjusted so as to interrupt sparks and dust.

The committee suggests that the National Machine Tool Builders' Association be requested to form a joint committee to consider with this committee matters relating to safety in connection with grinding wheels.

Code for the Use of Abrasive Wheels

Leading Features of a Safety Code Drawn Up by Abrasive Wheel Manufacturers and Covering Parts of Grinding Machines Related Thereto

Recognizing the lack of appreciation among many users of abrasive wheels, and among officials of State labor departments and State factory inspectors, of the important factors bearing on safety in connection with abrasive wheels, the abrasive wheel manufacturers appointed a committee to draft a code for safe practises in relation to abrasive wheels. This code is to be used as the foundation of a campaign for uniform State laws and uniform insurance rules in an endeavor to overcome present and prevent future unsafe practises, and also to eliminate much of the confusion existing at present brought about from the lack of uniformity in State and insurance requirements.

The report of a special committee appointed by the National Machine Tool Builders' Association, printed at length in these columns, May 14, 1914, to consider safety in connection with abrasive wheels and grinding machines, and a tentative report of a special committee appointed by the State of Pennsylvania to draft laws pertaining to grinding and polishing, were used as a basis of consideration for the code which has been drawn up and which has been approved by the following abrasive wheel manufacturers.

Abrasive Material Company, Philadelphia.
American Emery Wheel Works, Providence, R. I.
Bridgeport Safety Emery Wheel Company, Bridgeport, Conn.
Carborundum Company, Niagara Falls, N. Y.
Canadian-Hart Grinding Wheel Company, Hamilton, Ont.
Commercial Corundum & Emery Wheel Company, Chicago.
Cortland Corundum Wheel Company, Cortland, N. Y.
Dayton Grinding Wheel Company, Dayton, Ohio.
Detroit Grinding Wheel Company, Detroit.
Dominion Abrasive Wheel Company, Toronto, Ont.
Hamden Corundum Wheel Company, Springfield, Ohio.
Manhattan Rubber Mfg. Company, New York City.
National Corundum Wheel Company, Buffalo, N. Y.
New York Belting & Packing Company, New York City.
Norton Company, Worcester, Mass.
Pittsburgh Emery Wheel Company, Pittsburgh.
Safety Emery Wheel Company, Springfield, Ohio.
Springfield Mfg. Company, Bridgeport, Conn.
Star Corundum Wheel Company, Detroit.
Sterling Grinding Wheel Company, Tiffin, Ohio.
Superior Corundum Wheel Company, Waltham, Mass.
Vitrified Wheel Company, Westfield, Mass.
Waltham Emery Wheel Company, Waltham, Mass.

Abrasive wheel manufacturers recommend three general types of safety devices to be used for grinding wheels, namely, protection flanges, protection hoods and protection chucks. It will be impracticable to print the code at length, but the following, pending its printing and distribution, will indicate the main stipulations. It may be mentioned that the National Machine Tool Builders' Association has approved the code.

PROTECTION FLANGES

The abrasive wheel manufacturers recommend protection flanges of the double or single concave type, used in conjunction with wheels having double or single convex tapered sides or side.

New installations of protection flanges for double tapered wheels shall have a taper of not less than $\frac{3}{4}$ in. to the foot for each flange. New installations of protection flanges for single tapered wheels shall have a taper of not less than $\frac{3}{4}$ in. to the foot.

Each flange, whether straight or tapered, shall be relieved or recessed at the center at least $\frac{1}{16}$ in. on the side next to the wheel for a distance as specified in the table of dimensions.

All tapered flanges over 10 in. in diameter shall

be of steel or material of equal strength. Tapered flanges 10 in. and smaller in diameter may be made of cast iron. Both flanges in contact with the wheels shall be of the same diameter.

Dimensions in Inches of Tapered Flanges and Tapered Wheels Where Hoods Are Not Used in Conjunction Therewith.

A—Maximum flat spot at center of flange.						
B—Flat spot at center of wheel.						
C—Minimum diameter of flange.						
D—Minimum thickness of flange at bore.						
E—Minimum diameter of recess in taper flanges.						
F—Minimum thickness of each flange for single taper at bore.						
Diameter of Wheel	A	B	C	D	E	F
6.....	0	1	3	$\frac{3}{8}$	2	$\frac{3}{8}$
8.....	0	1	5	$\frac{3}{8}$	$3\frac{1}{2}$	$\frac{3}{8}$
10.....	0	2	6	$\frac{3}{8}$	4	$\frac{3}{8}$
12.....	4	$4\frac{1}{2}$	6	$\frac{3}{8}$	4	$\frac{3}{8}$
14.....	4	$4\frac{1}{2}$	8	$\frac{3}{8}$	$5\frac{1}{2}$	$\frac{3}{8}$
16.....	4	6	10	$\frac{3}{8}$	7	$\frac{3}{8}$
18.....	4	6	12	$\frac{3}{8}$	8	1
20.....	4	6	14	$\frac{3}{8}$	9	1
22.....	4	6	16	$\frac{3}{8}$	$10\frac{1}{2}$	$1\frac{1}{4}$
24.....	4	6	18	$\frac{3}{8}$	12	$1\frac{1}{4}$
26.....	4	6	20	$\frac{3}{8}$	$13\frac{1}{2}$	$1\frac{1}{4}$
28.....	4	6	22	$\frac{7}{8}$	$14\frac{1}{2}$	$1\frac{1}{4}$
30.....	4	6	24	$\frac{7}{8}$	16	$1\frac{1}{4}$

PROTECTION HOODS

Protection hoods shall always be used where practical with wheels not provided with protection flanges. Hoods shall be designed and constructed of a material sufficiently strong to retain all pieces of a broken grinding wheel. Hoods shall conform as nearly as possible to the periphery of the wheel, and shall be designed to leave exposed the least portion of the wheel compatible with the work, and shall be of the adjustable type or provided with a sliding tongue or similar device, or a method of contracting the rim, for the purpose of closing the opening in the hood as the wheel is reduced in diameter, to afford maximum protection at all times. Protruding ends of the wheel arbors and their nuts shall be guarded.

Cups, cylinders and sectional ring wheel shall be either protected with hoods, or inclosed in protection chucks, or surrounded with protection bands. Not more than one-quarter of the height of such grinding wheels shall protrude beyond the provided protection.

GENERAL SAFETY REQUIREMENTS

Before mounting, all wheels shall be closely inspected to make sure that they have not been injured in transit, storage or otherwise. For added precaution wheels other than of the elastic and vulcanite type should be tapped lightly with a hammer; if they do not ring with a clear tone they should not be used. Damp wheels when tapped with a hammer may not give a clear tone. Wheels must be dry and free from sawdust when applying this test.

Grinding wheels shall fit freely on the spindles, they shall not be forced on nor shall they be too loose. Wheel arbor holes shall be made 0.005 in. larger than the machine arbor. The soft metal bushing shall not extend beyond the sides of the wheel at the center.

Ends of spindles shall be threaded left and right so that the nuts on both ends will tend to tighten as the spindles revolve. Care should be taken in setting up machines that the spindles are arranged to revolve in the proper direction, else the nuts on the ends will loosen.

Straight Flanges and Straight Wheels Used with Protection Hoods.

Diameter of wheel, in.	Minimum outside diameter of flange, in.	Minimum diameter of recess, in.	Minimum thickness of flange at bore, in.
6	2	1	$\frac{3}{8}$
8	3	2	$\frac{3}{8}$
10	$3\frac{1}{2}$	$2\frac{1}{4}$	$\frac{3}{8}$
12	4	$2\frac{3}{4}$	$\frac{1}{2}$
14	$4\frac{1}{2}$	3	$\frac{1}{2}$
16	$5\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{2}$
18	6	4	$\frac{5}{8}$
20	7	$4\frac{1}{2}$	$\frac{5}{8}$
22	$7\frac{1}{2}$	5	$\frac{5}{8}$
24	8	$5\frac{1}{2}$	$\frac{5}{8}$
26	$8\frac{1}{2}$	6	$\frac{5}{8}$
28	10	7	$\frac{5}{8}$
30	10	7	$\frac{5}{8}$

Wheels shall never be run without flanges. Both flanges in contact with the wheels shall be of the same diameter whether straight or tapered. Wheel washers of compressible material, such as blotting paper, rubber or leather, not thicker than approxi-

closed in a locked case, or some device shall be used which prevents motor from being run at too high speeds.

No user of wheels shall use on any given machine a wheel of larger diameter or greater thickness than specified by the machine builder.

If wheels become out of balance through wear and cannot be balanced by truing or dressing, they should be removed from the machine.

A wheel used in wet grinding shall not be allowed to stand partly immersed in the water. Water-soaked portion may throw the wheel dangerously out of balance.

Wheel dressers should be equipped with rigid sheet metal or other guards over the tops of the cutters, to protect operator from flying pieces of broken cutters.

Minimum Sizes of Machine Spindles in Inches for Various Diameters and Thickness of Grinding Wheels.

Dia. in.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
6	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
8	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
10	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
12	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
14	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
16	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
18	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
20	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
22	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
24	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
26	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
28	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
30	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
32	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5

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For protection against flying chips, etc., plate glass in metal frames can be placed just above the grinding spaces of the wheels. Where it is impracticable or undesirable to use a glass shield, a leather flap may be attached to the hood and adjusted so as to interrupt sparks and dust.

The committee suggests that the National Machine Tool Builders' Association be requested to form a joint committee to consider with this committee matters relating to safety in connection with grinding wheels.

OBITUARY

ROBERT M. OLIVER, for about nine years general superintendent of the plant of the Oliver Iron & Steel Company, Pittsburgh, was drowned January 13 in the Monongahela River near the works. It had been his custom to take exercise each afternoon by rowing, and on the day he met his death his boat was capsized by the heavy current. He was the son of David B. Oliver, president of the Board of Education, Pittsburgh, who was active in the steel trade in that city until a few years ago. Robert M. Oliver was born in Allegheny, now known as the North Side, Pittsburgh, March 29, 1880. He received his early education in the public schools in Allegheny and later attended the Hotchkiss School, Lakeville, Conn. About two years afterward he entered the employ of the Oliver Iron & Steel Company and later was made general superintendent. He was unmarried.

CHARLES E. SAMMOND, president and manager of the American Sales Company, Milwaukee, Wis., foundry supplies, and for many years head of the Stowell Mfg. & Foundry Company, South Milwaukee, died suddenly of heart failure at his home January 11, aged 54 years. He was a native of Brooklyn, N. Y., residing in the West since 1878. In association with John Stowell, his father-in-law, he organized the Stowell Mfg. & Foundry Company, becoming chief owner at Mr. Stowell's death. Two years ago he retired from the company and established a foundry supply business. He was active in civic affairs.

HENRY G. MORRIS, long prominent in the Philadelphia machinery trade, died in that city January 19, aged 76 years. For many years he was a noted authority on electrical and mechanical engineering. He was born in Philadelphia and after graduating from Haverford College became identified with Morris, Tasker & Co., one of the pioneer manufacturers of wrought-iron pipe and boiler flues. Later Mr. Morris started the Southwark Foundry, of which he was then the sole owner. He leaves his widow and three sons.

T. S. CLARK, former president of the Perry Iron Company, Erie, Pa., committed suicide January 16, his mind having probably become affected by business reverses. Two years ago he disposed of his blast furnace property in Erie to Pickands, Mather & Co., and organized the Alton Steel Company, which built a cotton-tie, hoop and band mill at Alton, Ill. This company was placed in the hands of a receiver last July. He was about 48 years of age.

WILLIAM REID, president Summit Stove Company, LaCrosse, Wis., died suddenly January 1, following an attack of apoplexy, aged 59 years. He came to this country from Scotland at the age of 26 and became associated with the stove industry at Troy, N. Y. In 1897 he was made president of the Summit Foundry Company, Geneva, N. Y., of which organization the Summit Stove Company was an offshoot in 1905.

WILLIAM H. ROWLEY, former president of the Canadian Manufacturers' Association, died January 13 in Toronto, aged 63 years. He was born in Yarmouth, N. S., and educated at the Royal Military School in Halifax. He then entered the Merchants' Bank of Ottawa and later assisted in forming the E. B. Eddy Company, of which he became president in 1906.

A. O. SLENTZ, vice-president and general manager of the Canton Foundry & Machine Company, Canton, Ohio, died suddenly January 11, aged 69 years. For 14 years he had been engaged in the sheet-metal machinery business and devoted a great deal of his time to the development of new machinery for working sheet metal.

WILMONT E. CLARK, owner and manager of the Mexico Steel Products Machine Company, Mexico City, Mex., died December 29, aged 47 years, at San Antonio, Texas, where he had been ill for a month. He had been a resident of Mexico City for the past 16 years.

HENRY SOHN, Hamilton, Ohio, a prominent foundryman and manufacturer, died January 17, aged 69 years. He had been in the foundry business at Hamilton 40 years and was a director in the Hooven, Owen, Rentschler Company. He leaves his widow.

ERNEST KONIGSLOW, head of the E. Konigslew Stamping & Tool Works, Cleveland, Ohio, died January 18, aged 63 years.

Bill to Make Metric System the Sole Standard

WASHINGTON, D. C., January 19, 1915.—A new campaign to establish the metric system as the sole standard for weights and measures in the United States has been set on foot, a bill having been introduced in Congress by Representative Dillon, of South Dakota, making the system permissive after the passage of the measure until July 1, 1920, when it is to be compulsory.

The bill provides that all equivalents between the units of the metric system and the English system now in common use shall be calculated from the fundamental relation, one meter being equivalent to 39.37 in. and one kilogram being equivalent to 2.204622 lb. avoirdupois. The effect of the passage of the bill, so far as the next five years are concerned, would be to legalize the metric system in all contracts and in transactions with the government, but afterward the continued use of the English system would constitute an offense, with regard to which the bill provides as follows:

That any person, corporation, company, society, or association who shall use, or offer and attempt to use, in any industrial or commercial transaction in the sale or purchase of any commodity any other weights and measures than those of the metric system on and after July 1, 1920, shall be guilty of a misdemeanor, and upon conviction thereof in any court of competent jurisdiction shall be punished by a fine of not more than \$500 or by imprisonment for not more than three months, or by both such fine and imprisonment.

The Dillon measure represents the revival of a movement set on foot in 1902 under the auspices of the Society for the Promotion of the Metric System, members of which embraced a number of well-known scientists from the government service, including officials who subsequently organized the Bureau of Standards. It is understood that Secretary Redfield will advocate its passage as likely to prove of value to the United States in the extension of foreign trade. In the case of Great Britain, a cable announcement has it that as the result of an act of Parliament, physicians, druggists, manufacturing chemists, etc., have just adopted the metric system. The present attitude of those who opposed the Southard bill in 1902 will probably be developed at hearings before the House Committee on Coinage, Weights and Measures which Representative Dillon will arrange for at an early date. W. L. C.

Steel Works Processes in Moving Pictures

The moving pictures which the United States Steel Corporation subsidiaries will show in connection with their exhibits at the Panama-Pacific Exposition in San Francisco make altogether a run of eight hours. The pictures were shown at 71 Broadway last week in the presence of officers of the corporation and others. Practically every important process in the manufacture of Steel Corporation products is depicted, from iron and coal mining to the drawing of fine wire. There are 25 reels and a total of 30,000 ft. of film. These motion pictures, which have been prepared and will be exhibited under the direction of C. L. Close, who is in charge of the Steel Corporation's bureau of safety, sanitation and welfare, will be a daily feature of the San Francisco exhibit, and schedules will be arranged and posted so that it will be possible for the visitor to see at a given hour the particular operation in which he is most interested.

The Ajax Mfg. Company, Cleveland, Ohio, has taken an order from the Willys-Overland Company, Toledo, Ohio, for seven large forging machines and three hot saws. It has also booked two foreign orders, one for four forging machines for shipment to Spain, and one for two machines for shipment to England.

Pittsburgh and Nearby Districts

Arrangements have been completed by which the Phillips Sheet & Tin Plate Company, Weirton, W. Va., has absorbed the Weirton Steel Company, of that place, manufacturer of cold-rolled strip steel, owned by the same interests. There will be no changes, except the transfer of stock and the elimination of the name Weirton Steel Company. The management will remain the same, E. T. Weir, of the Phillips Sheet & Tin Plate Company, having also been president of the Weirton Steel Company. S. S. McCormick, who has been in charge of sales, will continue to act in the same capacity for the strip-steel department of the Phillips Sheet & Tin Plate Company. It was felt that the further development of the business could be better and more efficiently handled by this consolidation.

Reports that the Youngstown Sheet & Tube Company, Youngstown, Ohio, would at once start the erection of eight more hot sheet mills, giving it 24, and 240 by-product coke ovens, are incorrect. President J. A. Campbell states that there will be no new work erected by his company until conditions in the steel trade are materially better.

The Brier Hill Steel Company, Youngstown, Ohio, will issue \$3,000,000 in bonds, of which only \$2,000,000 will at present be issued. The bonds are for the purpose of taking up short term notes and providing additional working capital. Their sale has been arranged for. The bonds will be retireable at the rate of \$200,000 per year, beginning January 1, 1917.

The Petroleum Iron Works Company, Sharon, Pa., builder of steel-plate construction, is working day and night with the largest force it has ever employed. It has large contracts for tanks of 55,000 bbl. capacity each, to be erected in California, Oklahoma, Texas, New York, Mexico, Chili, St. Thomas (D. W. I.) and Panama Canal Zone, and is also shipping large tankage to China and Japan. The company also has smaller work to be completed in the shops. In connection with the Pennsylvania Tank Car Company, an identified interest, it is turning out 100 cars per month of 8000 to 10,000 gal. capacity. During the period of depression in business, the shops of the Petroleum Iron Works Company have been operating steadily to full capacity, but at a margin of profit smaller than it should be.

No. 3 blast furnace of the Republic Iron & Steel Company, Youngstown, Ohio, was started January 12 and all four of its local stacks are now in blast, making about 1700 tons of pig iron per day. The company is operating eight out of 10 open-hearth furnaces, and its Bessemer steel plant is also in operation.

A. M. Byers & Co., Inc., Pittsburgh, are paying \$6 per ton to their puddlers at Girard, Ohio, in spite of the fact that the Amalgamated Association rate for January and February is \$5.50 per ton. The No. 1 puddling plant at Girard, containing 42 furnaces, is in operation, while No. 2, having 46 furnaces, is idle.

The plant of the Sligo Iron & Steel Company, South Connellsville, Pa., which has long been idle, was recently sold by the trustee in bankruptcy to H. L. Robinson, an attorney of Uniontown, Pa., who represented the bondholders, for \$50,000. It is not likely the plant will be started until business conditions materially improve.

At the annual meeting of stockholders of the Pittsburgh Emery Wheel Company, Pittsburgh, January 14, Charles G. Smith was re-elected president and general manager; J. Walter Hetzel, vice-president, and A. W. Smith, secretary and treasurer. Other directors elected were Charles E. Satler, James P. Allen and Robert W. Tener.

The Youngstown Concrete Company, Youngstown, Ohio, has received a contract for the reinforced steel bars to be used in the rebuilding of the Edison plant at Orange, N. J., destroyed by fire recently. The Trussed Concrete Steel Company, Youngstown, has received an order for the metal window sashes.

The National Association of Electrical Engineers, at an executive meeting in Pittsburgh, selected Detroit for the annual convention which is to be held in Sep-

tember, 1915. A paper on "Magnetic Control" was read by C. T. Henderson, Cutler-Hammer Mfg. Company, Milwaukee. F. D. Egan presided, in the absence of D. R. Jones, president.

The Aluminum Cooking Utensil Company, an identified interest of the Aluminum Company of America, is now occupying its new office building at New Kensington, Pa., where its main works are located. It is 80 x 203 ft., on a lot 100 x 260 ft., generous space having been provided for flower beds and lawns. The building contains all modern conveniences and is thoroughly fireproof.

H. W. Perkins, Moundsville, W. Va., will build a garage and machine shop on a site, 70 x 110 ft.

Chester, W. Va., plans the establishment of a municipal electric light plant. The mayor may be addressed for details.

The Municipal Shale Brick Company, Martinsburg, W. Va., is being organized for the manufacture of bricks, vitrified fireproofing, etc. A. B. Noll is in charge of plans for the company, which will be capitalized at \$250,000. Electric power equipment will be installed.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has organized a separate department for the production and sale of automobile accessories, to be known as the automobile equipment department, of which G. Brewer Griffin is manager, and to which he will devote his entire time. Mr. Griffin was formerly manager of the detail and supply department. The main offices of the new department will be at the Pittsburgh-Shady Side works of the company.

The report that the plant of the American Zinc & Chemical Company, Burgettstown, Pa., has been closed down on account of complications resulting from the European war is incorrect. The company states that it is operating its plant, turning out sulphuric acid to the amount of about 100 tons per day, and this week will start the manufacture of spelter. It has about completed one unit of its works. Three other units are to be erected, which will probably require two years or more.

The American Tar Products Company, operating a plant at Crab Creek, Ohio, buys all of the by-products of the new Koppers by-product coke oven plant of the Republic Iron & Steel Company, Youngstown, Ohio.

Press reports that No. 2 furnace of the American Manganese Mfg. Company, Dunbar, Pa., will be started up in a short time are untrue. No. 1 furnace is in operation on foundry iron, running 0.01 or less in sulphur.

The McKenna Brothers Brass Company, Pittsburgh, is machining an order for 52,000 brass shell caps, being part of a contract taken by the Westinghouse Electric & Mfg. Company. The McKenna Company reports its orders since January 1 to be materially better, and it is having a good demand for tool steels made by the Vanadium Alloy Steel Company, Latrobe, Pa., for which it is Pittsburgh agent.

The Osceola Silica & Firebrick company, Osceola Mills, Pa., has secured a contract for all of the firebrick for a large installation of water-tube boilers being made by the Commonwealth-Edison Company, Chicago, which is said to operate the largest battery of boilers under one roof in the world.

The New Castle Rubber Company, New Castle, Pa., which has been granted a charter with a capital of \$500,000, will engage in the manufacture of automobile tires and inner tubes, the capacity at the start being close to 400 tires per day. The company is occupying part of the plant of the New Castle Forge & Bolt Company, which has been idle for some time. John H. Wilson is president; C. H. Bolton, vice-president, and E. N. Ohl, treasurer. Branch offices are located in the Farmers' Bank Building, Pittsburgh.

No. 1 blast furnace of the American Steel & Wire Company at Donora, Pa., was blown in January 15 and both stacks at this plant are now running, turning out close to 1000 tons of pig iron per day.

The rebuilding of the No. 2 blast furnace of the Andrews & Hitchcock Iron Company at Hubbard, Ohio,

is nearly completed. The work is being done under the supervision of Julian Kennedy, consulting engineer, Bessemer Building, Pittsburgh.

The Carnegie Steel Company is now operating 24 out of 59 blast furnaces, and will probably blow in one or two more next week. No. 5 Duquesne was blown in January 14.

The Bessemer steel plant at the Shoenberger works of the American Steel & Wire Company, Pittsburgh, which has been idle for several months, is expected to start this week. It makes about 5000 tons of ingots per month.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel, on the evening of January 18. A paper entitled "Untangling Public Opinion" was read by Walter Linn, associate secretary of the Pennsylvania Manufacturers' Association, Land Title Building, Philadelphia.

PERSONAL

C. H. McCullough, Jr., vice-president and general manager Lackawanna Steel Company, who went abroad recently in connection with structural contracts which the French government expects to let, will return this week.

John A. Mathews, Ph.D., Sc.D., general manager of the Halcomb Steel Company, will deliver an address February 5 on "Iron in Antiquity and Today" before the Syracuse University chapter of Sigma Chi and the Syracuse branch of the Archeological Institute of America, of which he is vice-president. The lecture will be illustrated.

Thomas K. Glenn, president Atlanta Steel Company, has been chosen treasurer of the recently organized Georgia State Manufacturers' Association. Among other organizers of the association are William Kehoe, president Kehoe Iron Works, Savannah, and George R. Lombard, president Lombard Iron Works, Augusta, Ga.

Richard H. Mansfield, secretary of the Cutler-Hammer Mfg. Company, Milwaukee, Wis., has purchased the business, equipment and patents of the R. C. Wells Company, Fond du Lac, Wis., and has assumed active control and management of the business. The R. C. Wells Company was organized in 1911 and is a large producer of electric generators and ignition specialties for automobiles, gas engines and similar purposes.

Frank L. Herzog, formerly of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has resigned and is now connected with the drafting department of the United Engineering & Foundry Company, Pittsburgh.

John J. Gibson, formerly district manager for the Westinghouse Electric & Mfg. Company at Philadelphia, has been appointed manager of the detail and supply department of the Westinghouse Electric & Mfg. Company at East Pittsburgh to succeed G. Brewer Griffin.

H. A. Cochrane has been appointed traffic manager of A. M. Byers & Co., Inc., Pittsburgh, manufacturers of wrought-iron pipe, with plants at Pittsburgh and Girard, Ohio. This is a newly created position. W. B. Larkin, formerly manager of the advertising department, has been succeeded by N. Bowland, formerly advertising manager of the Duff Mfg. Company, Pittsburgh.

Major Joseph T. Speer, vice-president Pittsburgh Valve Foundry & Construction Company, Pittsburgh, has returned from an extended sojourn at Atlantic City greatly improved in health.

H. B. McMaster, commissioner for the Associated Metal Lath Manufacturers, who has been directing the co-operative work of the metal lath industry since 1910, has resigned to become manager of branches for the Berger Mfg. Company, Canton, Ohio, a large producer

of sheets and sheet-metal products. He went to Youngstown at the time of the organization of the General Fireproofing Company, of which he was secretary, resigning in 1908 to become manager of sales for the rod and wire department of the Youngstown Sheet & Tube Company. He left that company in 1910. Aside from his work with the Associated Metal Lath Manufacturers, he was manager of the Ward Nail Company, in the reorganization of which he took part, and during 1914 had charge of a bureau of development, organized by the Association of Sheet and Tin Plate Manufacturers, primarily for the purpose of launching a national campaign of concerted promotion in the interest of the sheet-metal industry. His connection with the Berger Company will begin February 1.

Archibald G. Smith, who has been connected with the Youngstown Iron & Steel Company, Youngstown, Ohio, since June, 1914, will be general superintendent of the new open-hearth plant now being erected by that company.

W. H. Donner, president Cambria Steel Company, Johnstown, Pa., has been elected a director of the Philadelphia National Bank of Philadelphia.

Hugh R. Corse has been appointed sales representative in Detroit, with headquarters in the Ford Building, for the bronze and brass casting department of the Titanium Alloy Mfg. Company. William M. Corse is manager of the department at Niagara Falls, N. Y.

D. Fairfax Bush and William Dette, of the firm of Crocker Brothers, New York, dealers in ferroalloys, pig iron and coke, are now on a trip to the Pacific coast.

L. R. Palmer, chief inspector of the Pennsylvania State Department of Labor and Industry, has been presented with a special gold medal by the American Museum of Safety of New York in recognition of his work for safety first through the National Council of Industrial Safety. He was formerly connected with the Jones & Laughlin Steel Company, at Pittsburgh.

Programme of Mining Engineers' Meeting

The iron and steel papers to be read at the meeting of the American Institute of Mining Engineers at New York City, February 15, in the Engineering Societies Building, are as follows:

G. K. Burgess and Sir R. A. Hadfield, "Sound Steel Ingots and Rails."

F. C. Langenberg and R. G. Webber, "Structure and Hysteresis Loss in Medium-Carbon Steel."

W. R. Shimer, "Effect of Finishing Temperatures of Rails on Their Physical Properties and Microstructure."

James F. Kemp, "The Mayari Iron-Ore Deposits, Cuba." Walther Mathesius, "High Blast Heats in Mesaba Practice."

Henry M. Howe and Arthur G. Levy, "Are the Deformation Lines in Manganese Steel Twins or Slip Bands?"

Arthur West, "A Modern Gas-Power Blower Station."

The meeting will hold its first session on Monday morning, February 15, at 10 a. m. It will be under the auspices of the Safety and Sanitation Committee and offers the following papers:

Frank H. Kneeland, "Safeguarding the Use of Mining Machinery."

Howard N. Eavenson, "Safety Methods and Organization of United States Coal & Coke Company."

S. Le Fevre, "Housing and Sanitation at Mineville."

J. Parke Channing, "Enlarging the Worth of the Worker and the Perspective of the Employer."

The iron and steel meeting is scheduled for 2 p. m. February 15, simultaneously with a session devoted to non-metallic minerals.

On Tuesday morning at 10 a. m. will be presented 10 papers covering in part mining machinery and on Tuesday afternoon at 2 p. m. will be held a session on fuels, including a paper on "Recent Developments in Coal Briquetting" by Charles T. Malcolmson, president Malcolmson Briquet Engineering Company, Chicago.

On Wednesday morning will be held a session on non-ferrous metallurgy and on Wednesday afternoon a session on electricity in mines and on mining.

Book Reviews

Electric Thermal Methods of Iron and Steel Production.

By John B. C. Kershaw. Pages, 233, 5¼ x 8¼ in. Cloth. Published by D. Van Nostrand Company, New York. Price \$3 net.

This small volume is referred to in the preface as a revised edition of the first one, which appeared in 1907. It is a good example of the printer's art, having some excellent photographic reproductions. It is, however, a compilation of random facts, a great many of which are distorted and mixed with much conjecture. Much of the material is too old, except, perhaps, for a historical review. The book lacks cohesion and does not make a substantial impression. It is deplorable to present such misinformation as this: "Direct-current generators can be employed for arc furnaces. . . . for electric furnace work"; and to follow this by saying, "No electrolytic action occurs in the furnace," without making any qualifying statements. Again we find: "It has been found that the washing-out process, by which the impurities, phosphorus and sulphur are removed from the molten metal by means of suitable slags, can only be effectively and rapidly carried out with the aid of high temperatures." Experience has shown that phosphorus is most easily removed at temperatures several hundred degrees lower than that best adapted for removing sulphur. Amberg is quoted later on, disproving this earlier statement in the book.

It is quite inconsistent with the facts to state that "the disadvantage of the induction furnace is its comparative low temperature" (meaning, of course, the temperature of the bath). The author is evidently unaware of the results of tests which were laid before the 1912 meeting of the International Chemical Congress, which showed that in the induction furnace molten metal has been heated to between 2200 and 2400 deg. C. Just why "danger to workers is considerably minimized when three-phase current is generated," instead of single or two-phase is not apparent.

The author states that there is no coal in the "strip of the Western border of the United States," whereas there has been a development of extensive coal mines there for some time. On page 38 we find: "The pig iron produced there is practically free from phosphorus, sulphur and manganese and is, therefore, suitable for foundry workers on the Pacific coast." Just how our Pacific coast foundries can make iron run "practically" without any phosphorus is not stated. The so-called "details" covering the difference between Kjellin and Frick furnaces could hardly be called "unimportant." Just why two-phase current is cheaper to generate than single-phase is also left to the reader. Too much space is given over to furnaces of which only one has ever passed the experimental stage, and then has been on the market for several years as a lone exhibit. Many pages are also devoted to furnace designs which are only on paper.

Metallurgical observations are intermingled with the descriptive matter in an unhappy way. The unimportant has been given as much space and prominence as the important, thus giving to the uninitiated a distorted perspective of the situation.

In giving the comparative costs of electric and other steels, no mention is made of the important fact evidenced by Osborne's long series of tests, that between 0.10 and 0.40 carbon steel the electric product is from 10 to 20 per cent. stronger, other things being equal; that is to say, if electric steel of the same composition costs 10 or 20 per cent. more to make, this much less could be used and the ultimate cost would be the same. Under running costs, we find the statement that "other charges being equal, the furnace and process that has the smallest power consumption will prove the cheapest to work." This statement is incorrect, because the furnace "cheapest to work" is the one which most nearly meets local conditions; for a larger factor than the power consumption is—will the furnace operate intermittently about as well and cheaply as continuously? This, of course, applies more to foundry than to the other uses. Some furnaces answer this question satisfactorily, while others do not. For the large steel mill this intermittent service problem is of small moment,

and yet there is another item besides power consumption and intermittent service which makes a furnace cheapest to work, and that is cost of attendance. Some large furnaces represent twice as great a labor cost as others, and this factor often overbalances the power consumption differential.

C. H. VOM B.

"The Electric Furnace in Metallurgical Work," by Dorsey A. Lyon, Robert M. Keeney and Joseph F. Cullen, is Bulletin No. 77 of the Bureau of Mines, Washington. Part I, by Mr. Cullen, discusses the design, construction and operation of electric furnaces, comparing them with combustion furnaces. Part II, by Mr. Lyon and Mr. Keeney, presents a brief statement of the extent to which the electric furnace has been applied to the metallurgy of metals when the product is in the form of the metal and not of a ferroalloy. The discussion embraces the electric smelting of ores of aluminum, copper, gold and silver, iron, lead, complex sulphides and zinc, iron being only briefly treated because it has already been fully discussed in Bulletin No. 67. Part III, by Mr. Keeney, includes an account of the development of the manufacture of ferroalloys in the electric furnace, descriptions of some types used in such production as well as of some plants in Europe visited by the writer, and information regarding the manufacture and uses of each alloy.

Heaton's Annual, the Commercial Handbook of Canada, eleventh edition, has just been issued by Heaton's Agency, Toronto. The price is \$1 per copy, and postage 12 cents. Year by year this publication has been developed to meet the requirements of those who want a Canadian book of easy reference. It gives directories of Government officials, insurance companies, banks, railroads, steamships, postal, parcel post and cable rates, commercial regulations, cost of travel, customs tariff, etc. The digest of the customs laws and regulations includes all the memoranda and bulletins that are issued by the department to the customs officials and cannot, so far as we know, be found collected in any other single volume. It also gives a description of all the towns in Canada of any commercial importance.

A revised edition of "How to Run and Install Gasoline Engines," by C. VonCulin, has been brought out by the Norman W. Henley Publishing Company, 132 Nassau street, New York City. The object of this little book, which retails for 25 cents, is to furnish a course of instruction for the beginner or the business man who uses a marine engine, say, for pleasure or profit but who does not have time or inclination for a more complete technical book. The instructions given are calculated to enable any person to install, care for and operate his own engine. The index refers to each trouble, remedy and subject, both alphabetically and by paragraph numbers.

Earlier than in any other year, Poor's Manual of Railroads for 1915 is issued. The present volume is the 48th annual number, and is devoted exclusively to the steam railroads. Statements are given of all the 1914 reports that have appeared and general information is revised to December, 1914. The early date of issue is in the interest of subscribers; at the same time the standard of this publication for completeness, accuracy and freshness of data is maintained.

"The Man with a Job"

In a booklet of a dozen pocket-size pages, Wightman D. Roberts, Huntington, W. Va., brings out clearly some of the arguments against socialism and government ownership. He calls it "The Man with a Job," and has put it in the form of a soliloquy by the man himself. What Mr. Roberts has prepared is in answer to the suggestion of a manufacturer that he write something calculated to fortify employees capable of thinking against the arguments of professional agitators.

Liability of Machinery Manufacturers

Responsibility to Persons Not in Contractual Relation with Them, Respecting Defective Construction of Machines

BY A. L. H. STREET

The courts are frequently called upon to determine whether a manufacturer of a machine which has been defectively constructed or installed is liable for resulting injury to a person who stands in no direct or indirect contractual relation with the manufacturer, as where an employee of the purchaser of a machine is injured while operating it, or where the guest of an owner of an automobile or other vehicle sustains injuries while riding in it.

In the leading cases on this subject which have been passed upon by the appellate courts of this country, manufacturers have denied responsibility on the ground that they had no dealings with the injured persons. These defenses, as will be seen by the following reference to adjudicated cases, have been disposed of by the courts according to whether the particular machine was one which was imminently dangerous if improperly constructed, and whether there was any showing of negligence in its manufacture.

THE PRINCIPLE ON WHICH LIABILITY RESTS

As stated by the Kentucky Court of Appeals in the case of *Olds Motor Works vs. Shaffer*, 140 Southwestern Reporter 1047, the liability of a manufacturer for injury to third persons rests on the principle that one who manufactures articles for general use is under obligation to so construct them that they will not be unsafe and dangerous. The court said in this case: "The class of cases in which the maker is liable to third persons is quite limited; the general rule being that no liability attaches for injury to persons who cannot be brought within the scope of the contract."

Where the article itself is not inherently or intrinsically dangerous to health or life, a third party, seeking to hold the maker liable for injuries suffered by him in the use of the article, must show that the maker knew it was unsafe and dangerous, and either concealed the defects, or represented that it was sound and safe. But even when this is shown, the maker will not be liable if it is made to appear that the purchaser had knowledge of the defects at and before the third party was injured in using it."

WHEN THERE IS NO LIABILITY

As late as 1907 the Massachusetts Supreme Judicial Court, in deciding that an employee who was injured by the bursting of a defective emery wheel could not recover from the manufacturer who sold the wheel to the employer, even if the manufacturer was chargeable with knowledge of the defect, said: "The manufacturer of an article of merchandise which he puts upon the market ordinarily is not responsible in damages to those who may receive injuries caused by its defective construction, but to whom he owes no contractual relation, although by the exercise of reasonable diligence he should have known of the defect." (*Lebourdais vs. Vitrified Wheel Company*, 80 Northeastern Reporter 482.)

Knowledge by a manufacturer of the defective condition of a steam threshing machine was held by the Missouri Supreme Court to be essential to liability for the death of an employee of the purchaser, caused by an explosion of the machine. (*Heizer vs. Kingsland & Douglas Mfg. Company*, 19 Southwestern Reporter 630.) And the Texas Court of Civil Appeals decided that the manufacturer of a gasoline burner was not responsible in damages for injuries sustained by plaintiff in an explosion of the device, in the absence of proof of negligence in its construction. The Rhode Island Supreme Court declared that the maker was not liable for the breaking of a hook holding the weight of a drop press, resulting in injury to an employee of the

buyer, although there may have been negligence in the manufacture of the press; the machine not being imminently dangerous, and no fraud having been practiced in its sale. (*McCaffrey vs. Mossberg & Granville Mfg. Company*, 50 Atlantic Reporter 651.) Negligence in the manufacture of a gun is essential to the manufacturer's liability for injuries caused by its explosion, according to a decision of the New York Supreme Court. (*Favo vs. Remington Arms Company*, 73 New York Supplement 788.) In a similar case, it was held by an Illinois court that a manufacturer of a shotgun shell was not liable for the loss of a hunter's thumb caused by the bursting of the gun in which the shell was used, where it appeared that skill and unremitting care were shown in the manufacture of defendant's shells, and there was no evidence of a defect in the particular shell. (*Bonham vs. Winchester Repeating Arms Company*, 179 Illinois Appellate Court Reports 469.) And a company which rebuilt a traction engine was exonerated from responsibility for the death of an employee of the buyer caused by a rusted and worn seam. (*Indiana Appellate Court, Landeman vs. Russell & Co.*, 91 Northeastern Reporter 822.)

WHEN THE MANUFACTURER IS LIABLE

But "one who manufactures and sells an article not ordinarily of a dangerous nature, which is calculated for use by others than the purchaser, may be liable to a person not the purchaser who uses it in the usual course of business, for injuries due to defects which render the use of the article dangerous to life or limb." (*Minnesota Supreme Court, Krahn vs. J. L. Owens Company*, 145 Northwestern Reporter 626.) In this case plaintiff, a farmer, recovered judgment against defendant for injury received through the breaking of a defective board on an agricultural machine which was being used by a thresherman on plaintiff's farm. The court, however, decided that before plaintiff could recover he must show that defendant knew of the defective condition when the machine was sold, or should have known thereof.

The New York Court of Appeals has sustained the liability of a maker of a coffee urn used in a hotel, for injury to an employee resulting from an explosion of the urn, which was shown to have been defectively constructed. (*Statler vs. George A. Ray Mfg. Company*, 88 Northeastern Reporter 1063.) And in *Barker vs. Erie City Iron Works*, defendant was held liable for injury to a third person caused by the explosion of a boiler. (102 Pennsylvania Supreme Court Reports 156.) And in *Davies vs. Pelham Hod Elevating Company*, the New York Supreme Court affirmed judgment for injuries sustained by the employee of the buyer of a derrick, in consequence of a claimed defect in the appliance. (20 New York Supplement 523.)

The principles here involved are further illustrated by the holding in *O'Brien vs. American Bridge Company* that defendant was responsible for injury to travelers on a bridge caused by its collapse a few weeks after its construction for a county by the defendant. (125 Northwestern Reporter 1012.) The court expressly reserves the point, however, that "the mere fact that the party sought to be charged has broken his contract with the other party thereto is not itself sufficient to render him liable for consequential damages to a stranger to that contract."

The Kentucky Court of Appeals has decided that the manufacturer of a railroad car is liable for injury to a railroad company's employee caused by a defect in a brake rod, which was concealed by paint. (*Ward vs. Pullman Company*, 137 Southwestern Reporter 233.)

One of the largest awards made by the courts

against manufacturers was allowed by the Illinois Appellate Court in 1912 against Montgomery Ward & Co. Plaintiff recovered a judgment for \$35,000 for injuries sustained by him while using a sawing machine, due to the bursting of a balance wheel, which proved to have been defectively cast. The machine was bought by plaintiff's employer from the defendant under a representation that it was safe.

In another interesting case, the Wisconsin Supreme Court decided that since the laws of Wisconsin made it unlawful to sell toy pistols in the State, a wholesaler who made a sale in the State was liable for the death of a boy through the use of a pistol bought from a retailer, who had in turn bought from the wholesaler.

Department of Labor to Find Workmen for Manufacturers

WASHINGTON, D. C., January 19, 1915.—A radical change in the policy of the Department of Labor, just adopted, will place at the disposal of manufacturers in all industries the facilities of the Division of Information in finding skilled workmen to meet shortages in the labor market except such as may result directly from strikes, lockouts or other labor disputes. When the Division of Information of the Bureau of Immigration was originally organized its activities were limited strictly to finding employment for newly arrived alien men and women seeking work either as farm laborers or as domestic servants. When an occasional attempt was made to expand the service of the bureau to find employment for a skilled workman in any of the various trades, it was promptly met by active opposition on the part of the leaders of organized labor with the result that the Secretary of Commerce, who then presided over the bureau, promptly discouraged any further efforts in this direction. Applications for employment from skilled workmen in many trades continued to be received, however, and it became apparent that the Division of Information was ignoring a broad field of usefulness which could not be covered by any other governmental agency.

Somewhat tentatively the Division began to extend its work to find employment for certain classes of skilled laborers, but these activities were carefully guarded so that employers could not avail themselves of the bureau's facilities for procuring skilled workmen. The bureau, in effect, took the position that while it could with propriety find jobs for idle workers of certain classes it could not, under any circumstances, take the initiative from the employers' standpoint and find workmen for vacant jobs.

In 1914 an unprecedentedly large number of workmen applied to the Division of Information for work, the total number being 19,333. A very large percentage of these applications came from highly skilled workmen, including the following: blacksmiths, 71; carpenters, 724; electricians, 87; mechanical engineers, 12; factory hands, 1712; firemen, 1005; iron and steel workers, 97; machinists, 483, etc. General information regarding opportunities for work were given to many of these applicants and jobs were found for a majority of them. The disastrous fire at Salem, Mass., June, 1914, deprived a large number of boot and shoe workers of their positions and the Division of Information thereupon systematically canvassed the manufacturers of boots and shoes throughout the country by letter and telegram to find places for these people, with the result that not less than 1500 jobs were found, so that practically every individual who lost his place on account of the fire found a new one in a few days through the activities of the Division.

While the work of the Division of Information was thus expanding the labor leaders little by little withdrew their opposition. The original attitude of antagonism was regarded as due to systematic work on the part of certain employment bureaus which objected to the competition of the Division of Information and sought to array organized labor against the Immigration Bureau and all of its work. A circular letter is now about to be sent out by T. V. Powderly, chief of the division, to all commissioners and inspectors, directing them to get into touch with the managers of

railroads and industrial establishments for the purpose of procuring for them such labor, both skilled and unskilled, as they may need at any time. This letter is in part as follows:

"It is understood that in directing laborers to work for railroads and industrial establishments extreme care is to be exercised to prevent the sending of men to localities where labor troubles exist or are threatened, or to places where labor conditions would thereby be disturbed. The necessary blanks, now being printed, for carrying on this work will be forwarded as soon as delivered by the Government Printing Office."

It will be observed that the present policy of the Division of Information extends it to citizens of the United States, the only qualifications of an applicant being that he shall be of good character and earnestly in search of employment. The cooperation of the Post-office Department and the Department of Agriculture has been obtained to secure information regarding opportunities for workmen, and a system of bulletins, to be posted in postoffices of the country and in other conspicuous places, has been adopted. With these new methods the Division of Information is rapidly developing into a great Federal employment agency, the usefulness of which to both employer and workmen cannot fail to be very great.

W. L. C.

New England Foundrymen's Annual Meeting

The annual meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, on the evening of January 13, with a large attendance. The reports of officers showed that the association's year had been a prosperous one. Officers for 1915 were elected as follows: President, A. F. Corbin, Union Mfg. Company, New Britain, Conn.; vice-president, W. B. Leach, Hunt-Spiller Mfg. Company, Boston; treasurer, George H. Gibby, Gibby Foundry Company, Boston; secretary, Fred F. Stockwell, Barbour-Stockwell Company, Cambridge. Executive committee—Charles A. Reed, Reed, Fears & Miller, Boston; Stephen E. French, Athol Machine Company, Athol, Mass.; H. Paul Buckingham, Arcade Malleable Iron Company, Worcester, Mass.; L. J. Harley, Jr., Harley Company, Springfield, Mass.; T. R. Scott, Brown & Sharpe Mfg. Company, Providence, R. I. As is the custom with the association, a large portion of the evening was given up to a most enjoyable entertainment.

The Chicago Foundrymen's Club

At its annual meeting, held at the Hotel Sherman, Saturday evening, January 16, the Chicago Foundrymen's Club reelected L. C. Young, McDowell Foundry Company, president for the ensuing year. Oliver Goldsmith, W. D. Allen Mfg. Company, was chosen vice-president; C. E. Hoyt, secretary and treasurer. J. A. Gallagher, H. S. Vrooman, C. B. Carter and C. E. McArthur were elected directors for two years. The interest displayed at this meeting gave promise of a profitable year. A meeting of the board of directors has been called for Saturday evening, January 23, to be held at the City Club.

Large Damages for Personal Injury

One of the largest compensatory awards for personal injury given in Milwaukee, Wis., in many years was the verdict of \$8997.50 granted Roman Januscewski against the Northwestern Malleable Iron Company, January 14. Januscewski asked \$25,000 damages as the result of being caught in a whirling shaft while employed as an oiler. Many of his bones were broken and he underwent nine distinct operations.

Sheet-Mill Wages Readjustment

A readjustment of the wages of the employees of the Stark Rolling Mill Company, Canton, Ohio, has been made, the men being placed on a sliding scale basis, which means a cut of about 14 per cent. in wages, with the prevailing sheet prices. The adoption of the scale means that prices will have to advance to 2.25c. for No. 28 black for the men to earn the wages they received before the readjustment.

Machinery Markets and News of the Works

A slow, but healthy improvement in the domestic demand for machine tools is evident in a number of cities and it promises to give more general satisfaction than the heavy buying for export which now appears to be subsiding. In New York there has been some attractive business and more is pending. Buyers are much more numerous in Chicago, though business is still scattered and hampered by the specifying of early delivery. The Wabash Railroad has bought a number of tools for its Decatur shops, but in general railroad buying is light. Single tools and small lots make up the run of buying in Milwaukee. Improvement continues in Detroit, where the week's sales reached a respectable total; in that city there is an over-stock of second-hand tools for which demand is light. The foreign demand is lighter in Cleveland, but the domestic request for lathes has improved. In Cincinnati, also, the export trade is lighter, but the milling-machine business is holding up well and Canada has been a purchaser of many machines. The foundry business in Cincinnati is better than it has been for many months. In the Central South the demand for heavy power equipment has improved and the boiler trade is more active, but in general business is below expectations. Actual transactions show no substantial increase in the Birmingham territory. Conditions in Texas are growing better, and the same can be said of the St. Louis district. In the Pacific Northwest the machine tool business is limited to small scattered orders, but it is believed that the spring will bring a lively demand.

New York

NEW YORK, January 19, 1915.

The domestic demand for machine tools continues to develop in a manner which is satisfactory to the trade. Not only have some good orders been placed, but there are pending some propositions of exceptionally noteworthy size and the number of small and scattered sales and inquiries is greater. A representative seller finds that he has in hand more domestic inquiries than for six months. The Splittorf Electrical Company, Newark, N. J., manufacturer of magnetos, has practically placed orders for a large list of tools and another maker of magnetos in Brooklyn also has an inquiry out for several machines. An engine-building company in New York State has purchased a number of tools. The Norton Grinding Company, Worcester, Mass., has made a sale of 15 grinding machines through a French representative in New York. An Eastern steel company has directed that prompt deliveries be made on a number of punches and shears on which delivery had been postponed since last August. Business from an automobile parts maker is near closing.

An interesting phase of the situation is that those makers of machine tools who have booked a great deal of business largely because they made the types of machines the countries at war need, have been obliged to increase their production equipment and their buying is helping out less fortunate manufacturers. In some cases the builders who are busy, are turning a part of their work, especially the making of cutting tools and accessories, to other shops.

The insulated wire department of John A. Roebling's Sons Company, Trenton, N. J., was destroyed by fire January 18 with an estimated loss of \$1,500,000. It is reported that plans for rebuilding have not yet been formulated. The wire mills and the wire rope works were not injured.

The International High Speed Steel Company, 478 Pearl street, New York, has awarded the contract for the erection of its rolling mill to be built at Rockaway, N. J., to the McClintic-Marshall Company, and the contract for the rolls and other equipment to M. Hoagland's Sons Company. W. G. Fisher is president.

E. S. Fickes, Oliver Building, Pittsburgh, Pa., is preparing plans for a two and three-story factory, to be erected at Edgewater, N. J., for the United States Aluminum Company, 99 John street, New York.

The Morse Dry Dock & Repair Company, foot of Fifty-sixth street, Brooklyn, N. Y., has awarded the general contract to the Caye Hosford Company, 1123 Broadway, New York, for the construction of a manufacturing plant, at the foot of Fifty-seventh street, Brooklyn.

The three-story brick factory of the Frontier Chocolate Mfg. Company, Payne avenue and the New York Central Railroad, North Tonawanda, N. Y., was destroyed by fire January 10 with a loss of \$130,000 on building and machinery. Definite plans for rebuilding are contingent upon the procuring of new machinery equipment, as most of the machinery used in the plant was of German manufacture. Wayne G. Fahnestock is president.

S. W. Holmes, superintendent of the water department, Pulaski, N. Y., is arranging to replace present water turbines with electric motors.

Sealed proposals are being received by Frank A. Vanderlip, Room 215, 55 Wall street, New York City, for the con-

struction and equipment of a power house and heating plant to be erected at "Letchworth Village," Thiels, N. Y. Plans have been drawn by Lewis F. Pilcher, Albany.

Batavia, N. Y., will construct a water filtration plant. D. W. Tomlinson, Sr., and R. E. Chapin will have charge of the installation.

Plans are being completed for the new factory of the Buffalo Meter Company, Buffalo, to be erected at Main street and the Erie Railroad. It will be 65 x 125 ft., three stories and basement. George B. Bassett, 290 The Terrace, Buffalo, is president.

The Olean Specialty Company, Olean, N. Y., has been incorporated with a capital stock of \$100,000. It will manufacture varnishes, stains, finishes, etc. E. A. Sherwood, J. G. Sorg and C. M. L. Ashby are the incorporators.

S. Starth, superintendent of waterworks, Newark, N. Y., has completed plans for the installation of a centrifugal pump of 1,080,000 gal. capacity with 200-ft. head, an air compressor 10 x 12 ft., and automatic steam engines of 125 hp.

The Buffalo Wagon Works, 113 Carroll street, Buffalo, of which William D. Witch is owner, is having plans prepared for a new factory building 61 x 90 ft., two stories, which he will erect in the spring.

The International Specialty Company, Bridgeburgh, Ont., has completed plans for a three-story plant which it will erect on Niagara street, Buffalo.

G. T. Griggin, Dobbs Ferry, N. Y., has let the contract for the erection of a one-story garage and machine shop.

Philadelphia

PHILADELPHIA, PA., January 18, 1915.

Harrison Brothers & Co., Inc., manufacturer of white lead, etc., Thirty-fifth street and Grays Ferry road, Philadelphia, is making alterations and additions to its factory. F. S. Havens is purchasing agent.

The Bohem Mfg. Company, Philadelphia, has been incorporated with a capital stock of \$25,000, to manufacture a patented window screen and other sheet metal products. The incorporators are A. O. Bohem, Robert J. Moore, Philadelphia, and A. L. Carhart, Melrose Park, Pa. It will make use of an existing plant. A. O. Bohem is president.

The Pennsylvania Optical Company, 125 South Fifth street, Reading, Pa., has purchased a building adjoining its plant and expects to use it in connection with its lens grinding plant. Particulars have not yet been settled upon.

Burdan Brothers, Lebanon, Pa., are having plans drawn by Hauer & Mowere, 3110 Columbia street, Philadelphia, for a two-story brick ice-cream factory, 50 ft. square, at a cost of \$20,000. They will be in the market for a complete equipment.

The Baltimore Gas Appliance & Mfg. Company, Bayard and Hamburg streets, Baltimore, Md., has awarded the contract for the construction of a factory and warehouse, 135 x 215 ft., one and two stories, to be completed by May 1. Thomas C. Ratcliff is assistant manager and in charge.

W. H. Marshall, Elkton, Va., is in the market for a heavy draft slow burner engine of 100 hp. capacity.

W. H. Erickson, Kenbridge, Va., has purchased a franchise for an electric light plant and will establish an ice factory in connection with it.

The Baltimore & Ohio Railroad, with general offices at Baltimore, Md., plans to rebuild its shops at Cameron, W. Va. F. L. Stuart is chief engineer.

New England

BOSTON, MASS., January 18, 1915.

War business continues to be booked and for a growing variety of materials and products. In the machinery industry some very good orders have been received in the past fortnight for shipment to Europe. Canada is coming into greater prominence as a competitive source of war materials, largely because of the possibility that the United States may place extreme limits upon what shall be shipped from our ports. It is understood that Canada will build the submarines for England which were to have been constructed by the Fore River Shipbuilding Company at Quincy, Mass. This company is reticent as to its interests connected with the war, but the current belief is that large quantities of its machine equipment have been shipped to Canada and will later be replaced by new tools. The possibility also exists, according to rumor, that a group of large submarines will be built at Fore River for delivery to a foreign government after the war has ended.

Instances are multiplying where American industries are profiting by the shutting off of the supply of foreign goods, especially of German products. The list includes various branches of the metal industry, chiefly hardware and specialties, but extends much farther. For instance, the celluloid business of Leominster, Mass., has been rid of its most serious competition and as a consequence is, comparatively speaking, flourishing. The trade of the United States with South American countries has not been materially benefited to date, so far as New England has observed the situation. However, a beginning has been made in developing this very important field of consumption.

The recent rains have relieved a winter drought that threatened to become serious. New England has come to be dependent upon water power, since the development of great privileges, especially on the Connecticut River and its larger tributaries, and storage was becoming pretty low. The watersheds are now yielding large volumes of water as the results of rains combined with melting snow and ice. The companies which operate these hydraulic power stations control auxiliary steam plants, chiefly in the works of their customers, but the water power is much more satisfactory because it responds so readily to variations in load regardless of the burden imposed.

The new plant of the Putnam Machine Company, Fitchburg, Mass., now owned by Manning, Maxwell & Moore, Inc., New York, is approaching completion and will soon be ready to receive its equipment, except the blacksmith shop building, the construction of which was deferred because the space that it will occupy was needed for other purposes while the great buildings were going up. The other buildings are completed except for details of the interior. The cranes are in place and are operating. The foundry cupola is practically erected. The heating plant is performing its work, and the transformers which will handle the high-tension current of the Connecticut River Company's line are on the premises. The buildings are among the finest in the country designed for the purpose, and have nearly 160,000 sq. ft. of floor space, which will be augmented by the use of older structures for storage. The machine shop is of magnificent proportions, and the foundry correspondingly large. The four-story pattern shop affords large space for storage as well as for the machine departments. For years the Putnam shops have been largely devoted to the manufacture of railroad shop machinery, and this will continue to be the chief specialty when the new works are operating.

The Suffield-Berlin Trap Rock Company, 18 Asylum street, Hartford, Conn., is in the market for machinery for a stone crushing plant, including crushers, engines, boilers, screens, locomotive cranes, pumps, drills, cars, etc. The equipment will be used in a new plant which will be established in Suffield as an addition to a property already operating in Berlin.

The Mysto Mfg. Company, New Haven, Conn., is preparing plans for the erection of a factory in Fair Haven. The structure will be of brick and concrete, either three or four stories.

The Hartford Rubber Works, Hartford, Conn., has awarded the contract for a brick addition 25 x 78 ft., one story, and a two-story addition 20 x 20 ft.

The National Folding Box & Paper Company, New Haven, Conn., will erect an additional building 100 x 350 ft., five stories and basement, of steel, brick and concrete.

Chicago

CHICAGO, ILL., January 18, 1915.

Machinery dealers report that the first two weeks of January brought a larger number of buyers to their stores than any similar period of November or December. Inquiry has been proportionately improved. The business offering still has the disadvantage of being much scattered and of that kind which requires the hardest solicitation to secure. A feature of the inquiry is the frequency with which earliest delivery is the controlling factor in the placing of an order. In a number of instances this has worked as a handicap on those tool builders whose plants are still rushing the work on export orders. The purchase of a new type multi-spindle automatic vertical lathe from a Wisconsin manufacturer by a Cleveland manufacturer of automobile engines is an interesting item. The railroads show no greater disposition to buy mechanical equipment and with a few exceptions will concede but little regarding the making up of budgets for the year ahead. The Wabash recently bought tools aggregating about \$7000 for its Decatur shops. The trading in second-hand tools is experiencing a decided lull. There is only a fair buying of transmission machinery, while auxiliary shop equipment and small tools are naturally affected adversely by the degree of idle plant capacity.

The Ponderick Piston Ring Company, Chicago, has been incorporated with a capital stock of \$30,000, by L. and C. Ponderick, and A. A. Landry, 3853 Rokeby street, to manufacture metallic piston rings, machinery and motors.

The Turbine Engine Mfg. Company, Chicago, has been incorporated with a capital stock of \$100,000, to manufacture turbine engines. The incorporators are W. S. Stewart, 3713 Lake Park avenue, S. E. Hill and John A. Brown.

The Koellner Refrigerator & Ice Machine Company, Chicago, has been incorporated with a capital stock of \$5000 to manufacture refrigerators, ice and refrigerating machinery. Henry G. Koellner, 4433 North Rockwell street, Blain J. Berbach and Otto C. Koellner are the incorporators.

The Burd High Compression Ring Company, Rockford, Ill., has been incorporated with a capital stock of \$50,000, to manufacture piston rings, machinery, tools, appliances, etc. A. A. Hyer, Rockford, is attorney for the company.

C. A. Axline has moved into the building formerly occupied by the Parrett Machine Company, Bloomington, Ill., and with his sons will conduct an automobile business, with machine shop in connection.

W. G. Keller, G. Tadich and E. Siple, Sandoval, Ill., have formed a joint partnership for the establishment of a brass foundry. The firm will specialize in the manufacture of brass ingots and castings, and also in zinc refining.

E. B. Clark, formerly superintendent of the Buda Foundry Company, Harvey, Ill., has organized the Joliet Foundry Company, which will occupy the Enterprise Foundry site on South Bluff street, Joliet, Ill. The new company will be ready to begin operations by March 1.

John G. McFarland, Wichita, Kan., will erect a three-story brick and concrete building which will be leased by J. J. Jones for use as a machine shop in connection with the Jones six-motor car plant.

The Nelson-McCaustland Company, which will manufacture the new Nelson harrow, is planning to open a factory at Atlanta, Iowa.

The St. Paul Structural Steel Company, St. Paul, Minn., has been incorporated with a capital stock of \$50,000 by Harry C. Palmer, and E. and T. M. Comfort. It will purchase and fabricate steel.

The Northwestern Iron & Metal Company, Racine, Wis., has increased its capital stock from \$10,000 to \$15,000.

The Wrought Iron Heater Company, Des Moines, Iowa, which recently opened sales offices there, will start a shop in the spring.

The Larsen Ice Machine Company has completed arrangements and will locate its factory in Ft. Madison, Iowa.

The Globe Machinery & Supply Company has purchased property on East Second street, between Walnut street and Court avenue, Des Moines, Iowa, and will make extensive improvements upon it.

Low Moor, Iowa, has voted bonds in the sum of \$8000 for a municipal water plant and electric lighting system.

The Des Moines Electric Company, Des Moines, Iowa, of which H. E. Chubbuck is vice-president, has made plans for the expenditure of more than \$500,000 for improvements this year. A large part of it will be used for additions to power plant. New turbo-generators with boilers and auxiliary apparatus will be installed.

The Duluth Crushed Stone Company, Duluth, Minn., is erecting a crushing plant which will more than double its present output.

Cincinnati

CINCINNATI, OHIO, January 18, 1915.

The demand for machine tools from abroad has slackened somewhat with a number of firms; nevertheless, several scattered orders are reported. Most of these were for lathes. Every lathe manufacturer in this vicinity is now working on full time and with a full force. The milling machine business is also holding up remarkably well. Radial and upright drilling machines are moving slowly, but more domestic business is under negotiation than for some time. Canada has recently been a good customer for lathes and other tools, although all of the machinery being shipped there now is not for Canadian shops. It is understood that a considerable part of it is re-exported.

The majority of the jobbing foundries are now melting more iron than for three years. The small electric tool business is showing some improvement. Second-hand tools are slow.

The Greaves-Reck Machine Tool Company and the Acme Machine Tool Company, Cincinnati, have lately received some very large orders for export. These companies also report the domestic trade as more satisfactory than for some time.

Norwood, Ohio, has decided to make changes in its lighting system, substituting a 110-volt alternating current, instead of a 220-volt direct current service to its domestic customers. This will necessitate the purchase of a large amount of electric lighting supplies on the part of householders and others. A number of manufacturing plants, now buying current from the city, will install individual lighting plants, thus creating a market for light generating equipment.

Palm Brothers, Norwood, Ohio, have tentative plans under way for the installation of an electric lighting plant for its factory.

The Helmuth Slate & Steel Company, Millersburg, Ohio, has increased its capital stock from \$25,000 to \$75,000. Nothing is known as to extensions planned.

The Standard Fuel Oil Engine Company, Willoughby, Ohio, whose incorporation was recently noted, is having plans prepared for a new factory.

The Leidecker Tool Company, Marietta, Ohio, has purchased the plant and business of the Sparks Drilling Jar Company, of Charleston, W. Va., and all machinery will be moved to Marietta.

The McGraw Tire & Rubber Company, East Palestine, Ohio, has increased its capital stock from \$1,000,000 to \$1,500,000, in order to take care of its growing business. Equipment details are not available.

The E. E. Burch & Son Machine Company, Newell, Ohio, has been incorporated with \$25,000 capital stock by E. E. Burch and others.

Indianapolis

INDIANAPOLIS, IND., January 18, 1915.

The Indian Air Pump Company, Indianapolis, has been incorporated by O. M. Pruitt, D. K. Hutchcraft and R. M. Pruitt, with \$10,000 capital stock, to manufacture machinery, principally air lift pumps.

The Otto & Grayson Mfg. Company, Indianapolis has been incorporated with \$10,000 capital stock to manufacture machinery, tools and metal devices. The directors are B. W. Simpson, J. H. Grayson and E. Simpson.

The Shawnee Mfg. Company of Indiana, Attica, Ind., has been incorporated by J. M. Washburn, J. A. Spangler and C. A. Lyons, with \$20,000 capital stock, to manufacture farming tools and machines.

The Portland Forge & Foundry Company, Portland, Ind., has been incorporated with \$80,000 capital stock, to do a general forging business. The directors are J. A. Long, L. G. Holmes and C. C. Cartwright.

The Parcel Post Scale Company, South Bend, Ind., has been incorporated by C. L. Kimball, Emerson B. Priddy and W. Kimball, with \$60,000 capital stock to manufacture and deal in scales.

The Van Auken Electric Car Company, Connorsville, Ind., has been dissolved.

The Auto-Matic Lighter Company, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture automobile accessories. The directors are E. W. Infield, O. J. Boulden and C. E. Haviland.

The Straube Piano Company, Hammond, Ind., has been incorporated by E. R. Jacobson, J. F. Jacobson and C. H. J. Thorby, with \$150,000 capital stock, to manufacture pianos.

Milwaukee

MILWAUKEE, WIS., January 18, 1915.

The machinery business has pursued the even tenor of its way and nothing of importance or significance has arisen. Machine-tool sales continue to be of the single or small lot order. In other lines business remains quiet, with hope of a revival based on an improvement in inquiries.

The Gisholt Machine Company, Madison, Wis., has booked orders for turret lathes which will keep the plant busy for some time. The orders are from the Bethlehem Steel Company and for British account. Part of the Gisholt plant is operating overtime, some departments running until 9 p.m.

The Northwestern Iron & Metal Company, Kenosha, Wis., has increased its capital stock from \$10,000 to \$15,000.

The C. B. Leidersdorf Tobacco Company, 270 Broadway, Milwaukee, has engaged Herman W. Buemming, architect, Milwaukee, to plan a \$45,000 factory of brick and mill construction, 30 x 120 ft., to be erected on Milwaukee street, between Buffalo and Detroit streets.

Gullbert & Funston, architects, Racine, Wis., are drawing plans for a public school building to cost \$90,000, including a complete manual training department. Construction will begin about February 1. J. J. Moritz is secretary of the board of education.

Plans for an addition to the East Side high school, Green Bay, Wis., now being prepared, will call for a manual training department. J. P. Hogan is chairman of the building committee.

The foundry department of the Gilson Mfg. Company, manufacturer of gasoline engines and castings, Port Washington, Wis., is working on an order for two carloads of chair castings for a furniture factory in London, Eng. The shops are working full time on engines for domestic consumption.

The Wisconsin Seating Company, New London, Wis., manufacturer of furniture and veneers, is about to erect two three-story additions to its woodworking shops, one 45 x 80 ft., and the other 40 x 40 ft. An addition has just been completed for the metal-working department. The company is purchasing additional wood-working equipment.

The Gilman Mfg. Company, Gilman, Wis., has amended its corporate articles to increase the capital stock from \$30,000 to \$45,000.

The Universal Oxygen Company, Sheboygan, Wis., manufacturer of gas and supplies for cutting and welding machines, has purchased the plant and business of the Wisconsin Welding & Cutting Company, 167 Barclay street, Milwaukee, and is increasing the equipment. The Milwaukee shop is a custom plant, serving a large number of factories and shops not having installations of welding and cutting apparatus.

The Common Council, DePere, Wis., has authorized a \$9000 sewerage and culvert project near the plant of the Western Steel & Iron Company and has thus insured the erection of a large addition by the company and prevented the proposed removal of the works to Green Bay, Wis. The improvement will be made at once.

Detroit

DETROIT, MICH., January 18, 1915.

The better feeling noted last week continues to be apparent. The demand for single tools is fair and sales of miscellaneous equipment and supplies swell the week's business to very respectable proportions. The second-hand machinery trade is rather dull. There has been such an amount of this class of equipment placed on the market the past six months, that its absorption is difficult. Manufacturing machinists generally report that orders are picking up somewhat, although conditions are still below normal. The foundry trade is also a little better engaged. Building permits show an increase, although industrial construction work is lacking.

The Detroit Motor Car Company, Flint, Mich., has been incorporated with a capital stock of \$500,000 and will engage in the manufacture of automobiles. It is an outgrowth of the Durant-Dort Carriage Company.

The Mt. Pleasant Motor Company, Mt. Pleasant, Mich., has been organized with a preliminary capitalization of \$5000 to manufacture automobiles. The car will be largely an assembled one at present. The incorporators are N. J. Brown, H. A. Sanford and W. A. Keen.

The C. C. Fleckenstein Company, manufacturer of leather products, Chicago, a \$50,000 corporation, has acquired a factory at Muskegon, Mich., and will remove its business to that city about February 1.

The Plymouth & Northville Gas Company, Northville, Mich., has been organized with \$20,000 capital stock to operate a gas plant. The incorporators are Clarence A. Fox, A. C. Baldwin and F. S. Harmon.

The International Mill & Timber Company, Bay City, Mich., has been incorporated to manufacture ready-to-erect houses. The backers of the company, R. S. Richardson, and W. D. Young, Jr., control large timber properties and manufacture will be carried on extensively.

The Benton Harbor Malleable Company, Benton Harbor, Mich., manufacturer of drop forgings and steel castings, is making tentative plans for an enlargement of its plant. A new building 50 x 150 ft. is contemplated.

The Gillett Mfg. Company, Clio, Mich., table manufacturer, is erecting an addition to its plant and will install additional equipment.

The Michigan Wire Goods Company, Niles, Mich., has been incorporated to manufacture iron and wire specialties by Carmi Smith, E. E. Woodford and Benjamin H. Smith. A temporary factory has been secured and machinery is now being installed.

Cleveland

CLEVELAND, OHIO, January 18, 1915.

The domestic demand for turret lathes has improved but the foreign demand is lighter than for the previous few weeks. Dealers report a moderate volume of buying in small orders but no new inquiry of any size. Builders of sugar-making machinery say that the outlook is bright for a good volume of business from Cuba in the next few months. Conditions growing out of the war have made the Cuban sugar makers unusually prosperous. Makers of heavy handling, mining, and power equipment including water wheels, report conditions quiet as few large industrial projects are being launched. The demands for industrial cars and locomotives is light, although some good orders have come recently from South America. Makers report a fair demand for small malleable castings.

Cleveland, Ohio, through its commissioner of purchases and supplies, will receive bids January 28 for two electric traveling cranes, one of 25 and one of 10 tons capacity for the waterworks department. On January 27 bids will be received for stokers, bunker, ash hoppers and for two 250-hp. water tube boilers for the city hospital.

The Willard Storage Battery Company, Cleveland, will proceed at once with the erection of the second unit of its new plant on East 131st street, this work being hastened as a result of the fire which recently destroyed part of its old plant. The building will be a one story brick structure, 90 x 200 ft.

The Standard Fuel Oil Engine Co., Willoughby, O., recently incorporated with a capital stock of \$50,000, will operate under the Blanchard patents and will manufacture internal combustion engines of the Diesel type, using crude oil for fuel. For the present the engines will be built by the Ohio Clay Machinery Company, Willoughby, Ohio. L. W. Penfield, president of the latter company, is president and general manager of the engine company.

The Toledo Ford Tire Company, Findlay, Ohio, which is fitting up a factory for the manufacture of automobile tires, will install a power plant with a 300-hp. engine and a boiler capacity of 450 to 500 hp.

The Cement Block & Roofing Company, Kenton, Ohio, is contemplating an addition to its plant.

A cement plant with a capacity of 1500 bbl. per day will be erected in North Industry, Ohio. The contract for the engineering work has been placed with the Atlas Engineering Company, Cleveland, by O. C. Barber, Barberton, Ohio. A. M. Schoefield of the Atlas Company has opened an office in the City National Bank Building, Canton, Ohio.

A new company is being formed in Sycamore, Ohio, for the manufacture of Aluminium kitchen utensils, and plans to erect a one-story building 72 x 140 ft. Paul Maliwurm, Ashland, Ohio, is one of the men backing the project.

The Fuel Saver Stove Company, Alliance, Ohio, recently organized, has elected the following officers: president, J. R. Quick; vice-president, Aaron Burkey; secretary, C. A. Notman; treasurer, C. S. Westover; and general manager, F. E. Burkey. It is making a gas stove patented by Mr. Notman.

The Frank B. Hall Company, Newton Falls, Ohio, has closed a five years' contract with Houghton & Richards, Boston, for the manufacture of power sewing machines and will probably make some extensions to its plant.

The Director of Public Service, Norwalk, Ohio, has taken bids for two rotary pumps with a capacity of 1600 gal. per min. each.

The United Chain & Manufacturing Company, Seville, Ohio, is installing additional machinery for making small chain and is putting in tool-room equipment.

The plant of the Columbia Fire Brick Company, Strasburg, Ohio, which was recently destroyed by fire with a loss of \$40,000, will be rebuilt. E. A. Bowman is the secretary.

The board of commissioners, Lucas County, Toledo, Ohio, will receive bids until 10 a.m., January 29, for light, heat and power plants.

The Central South

LOUISVILLE, KY., January 18, 1915.

Business remains quiet with machinery manufacturers and dealers. Although inquiries are fairly numerous, business actually placed is below expectations; and the return to normal conditions seems likely to be slow. The demand for heavy power equipment is improved, boiler manufacturers reporting prospects good and more jobs going through their shops than for some time. The demand is also good for small electric motors.

The Grocers' Baking Company, Louisville, has let building contracts for a \$40,000 plant. It will need motors from 3 to 10 hp. capacity and special equipment.

The Scottsville Ice & Cold Storage Company, Scottsville, Ky., is being organized with \$15,000 capital stock. It will build a plant immediately. The boiler-room and ice factory will be 51 x 60 ft. Edgar Zielian, Nashville, Tenn., is the engineer.

The Newport Culvert Company, Newport, Ky., has been incorporated with \$25,000 capital stock to manufacture open-hearth iron culverts, tanks, troughs, wagon tanks, etc. J. B. Andrews is president; J. G. Andrews, vice-president; and W. H. D. Wheat, manager.

Charles Howard, Baxter, Ky., will purchase a 10-hp. gasoline engine and other equipment for a flour mill.

The Kentucky Wagon Mfg. Company, Louisville, which recently received a contract for the delivery of 12,000 portable kitchens to the allied armies in Europe, has let a contract for the iron work to the Ohio Falls Iron Works, New Albany, Ind.

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The Edmondson Electric Company, Meadow View, Tenn., has begun the construction of a hydro-electric plant on Holston river to develop 2000 hp.

Cincinnati

CINCINNATI, OHIO, January 18, 1915.

The demand for machine tools from abroad has slackened somewhat with a number of firms; nevertheless, several scattered orders are reported. Most of these were for lathes. Every lathe manufacturer in this vicinity is now working on full time and with a full force. The milling machine business is also holding up remarkably well. Radial and upright drilling machines are moving slowly, but more domestic business is under negotiation than for some time. Canada has recently been a good customer for lathes and other tools, although all of the machinery being shipped there now is not for Canadian shops. It is understood that a considerable part of it is re-exported.

The majority of the jobbing foundries are now melting more iron than for three years. The small electric tool business is showing some improvement. Second-hand tools are slow.

The Greaves-Reck Machine Tool Company and the Acme Machine Tool Company, Cincinnati, have lately received some very large orders for export. These companies also report the domestic trade as more satisfactory than for some time.

Norwood, Ohio, has decided to make changes in its lighting system, substituting a 110-volt alternating current, instead of a 220-volt direct current service to its domestic customers. This will necessitate the purchase of a large amount of electric lighting supplies on the part of householders and others. A number of manufacturing plants, now buying current from the city, will install individual lighting plants, thus creating a market for light generating equipment.

Palm Brothers, Norwood, Ohio, have tentative plans under way for the installation of an electric lighting plant for its factory.

The Helmuth Slate & Steel Company, Millersburg, Ohio, has increased its capital stock from \$25,000 to \$75,000. Nothing is known as to extensions planned.

The Standard Fuel Oil Engine Company, Willoughby, Ohio, whose incorporation was recently noted, is having plans prepared for a new factory.

The Leidecker Tool Company, Marietta, Ohio, has purchased the plant and business of the Sparks Drilling Jar Company, of Charleston, W. Va., and all machinery will be moved to Marietta.

The McGraw Tire & Rubber Company, East Palestine, Ohio, has increased its capital stock from \$1,000,000 to \$1,500,000, in order to take care of its growing business. Equipment details are not available.

The E. E. Burch & Son Machine Company, Newell, Ohio, has been incorporated with \$25,000 capital stock by E. E. Burch and others.

Indianapolis

INDIANAPOLIS, IND., January 18, 1915.

The Indian Air Pump Company, Indianapolis, has been incorporated by O. M. Pruitt, D. K. Hutchcraft and R. M. Pruitt, with \$10,000 capital stock, to manufacture machinery, principally air lift pumps.

The Otto & Grayson Mfg. Company, Indianapolis has been incorporated with \$10,000 capital stock to manufacture machinery, tools and metal devices. The directors are B. W. Simpson, J. H. Grayson and E. Simpson.

The Shawnee Mfg. Company of Indiana, Attica, Ind., has been incorporated by J. M. Washburn, J. A. Spangler and C. A. Lyons, with \$20,000 capital stock, to manufacture farming tools and machines.

The Portland Forge & Foundry Company, Portland, Ind., has been incorporated with \$80,000 capital stock, to do a general forging business. The directors are J. A. Long, L. G. Holmes and C. C. Cartwright.

The Parcel Post Scale Company, South Bend, Ind., has been incorporated by C. L. Kimball, Emerson B. Priddy and W. Kimball, with \$60,000 capital stock to manufacture and deal in scales.

The Van Auken Electric Car Company, Connersville, Ind., has been dissolved.

The Auto-Matic Lighter Company, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture automobile accessories. The directors are E. W. Infield, O. J. Boulden and C. E. Haviland.

The Straube Piano Company, Hammond, Ind., has been incorporated by E. R. Jacobson, J. F. Jacobson and C. H. J. Thorby, with \$150,000 capital stock, to manufacture pianos.

Milwaukee

MILWAUKEE, WIS., January 18, 1915.

The machinery business has pursued the even tenor of its way and nothing of importance or significance has arisen. Machine-tool sales continue to be of the single or small lot order. In other lines business remains quiet, with hope of a revival based on an improvement in inquiries.

The Gisholt Machine Company, Madison, Wis., has booked orders for turret lathes which will keep the plant busy for some time. The orders are from the Bethlehem Steel Company and for British account. Part of the Gisholt plant is operating overtime, some departments running until 9 p.m.

The Northwestern Iron & Metal Company, Kenosha, Wis., has increased its capital stock from \$10,000 to \$15,000.

The C. B. Leidersdorf Tobacco Company, 270 Broadway, Milwaukee, has engaged Herman W. Buemming, architect, Milwaukee, to plan a \$45,000 factory of brick and mill construction, 30 x 120 ft., to be erected on Milwaukee street, between Buffalo and Detroit streets.

Gulbert & Funston, architects, Racine, Wis., are drawing plans for a public school building to cost \$90,000, including a complete manual training department. Construction will begin about February 1. J. J. Moritz is secretary of the board of education.

Plans for an addition to the East Side high school, Green Bay, Wis., now being prepared, will call for a manual training department. J. P. Hogan is chairman of the building committee.

The foundry department of the Gilson Mfg. Company, manufacturer of gasoline engines and castings, Port Washington, Wis., is working on an order for two carloads of chair castings for a furniture factory in London, Eng. The shops are working full time on engines for domestic consumption.

The Wisconsin Seating Company, New London, Wis., manufacturer of furniture and veneers, is about to erect two three-story additions to its woodworking shops, one 45 x 80 ft., and the other 40 x 40 ft. An addition has just been completed for the metal-working department. The company is purchasing additional wood-working equipment.

The Gilman Mfg. Company, Gilman, Wis., has amended its corporate articles to increase the capital stock from \$30,000 to \$45,000.

The Universal Oxygen Company, Sheboygan, Wis., manufacturer of gas and supplies for cutting and welding machines, has purchased the plant and business of the Wisconsin Welding & Cutting Company, 167 Barclay street, Milwaukee, and is increasing the equipment. The Milwaukee shop is a custom plant, serving a large number of factories and shops not having installations of welding and cutting apparatus.

The Common Council, DePere, Wis., has authorized a \$9000 sewerage and culvert project near the plant of the Western Steel & Iron Company and has thus insured the erection of a large addition by the company and prevented the proposed removal of the works to Green Bay, Wis. The improvement will be made at once.

Detroit

DETROIT, MICH., January 18, 1915.

The better feeling noted last week continues to be apparent. The demand for single tools is fair and sales of miscellaneous equipment and supplies swell the week's business to very respectable proportions. The second-hand machinery trade is rather dull. There has been such an amount of this class of equipment placed on the market the past six months, that its absorption is difficult. Manufacturing machinists generally report that orders are picking up somewhat, although conditions are still below normal. The foundry trade is also a little better engaged. Building permits show an increase, although industrial construction work is lacking.

The Detroit Motor Car Company, Flint, Mich., has been incorporated with a capital stock of \$500,000 and will engage in the manufacture of automobiles. It is an outgrowth of the Durant-Dort Carriage Company.

The Mt. Pleasant Motor Company, Mt. Pleasant, Mich., has been organized with a preliminary capitalization of \$5000 to manufacture automobiles. The car will be largely an assembled one at present. The incorporators are N. J. Brown, H. A. Sanford and W. A. Keen.

The C. C. Fleckenstein Company, manufacturer of leather products, Chicago, a \$50,000 corporation, has acquired a factory at Muskegon, Mich., and will remove its business to that city about February 1.

The Plymouth & Northville Gas Company, Northville, Mich., has been organized with \$29,000 capital stock to operate a gas plant. The incorporators are Clarence A. Fox, A. C. Baldwin and F. S. Harmon.

The International Mill & Timber Company, Bay City, Mich., has been incorporated to manufacture ready-to-erect houses. The backers of the company, R. S. Richardson, and W. D. Young, Jr., control large timber properties and manufacture will be carried on extensively.

The Benton Harbor Malleable Company, Benton Harbor, Mich., manufacturer of drop forgings and steel castings, is making tentative plans for an enlargement of its plant. A new building 50 x 150 ft. is contemplated.

The Gillett Mfg. Company, Clio, Mich., table manufacturer, is erecting an addition to its plant and will install additional equipment.

The Michigan Wire Goods Company, Niles, Mich., has been incorporated to manufacture iron and wire specialties by Carmi Smith, E. E. Woodford and Benjamin H. Smith. A temporary factory has been secured and machinery is now being installed.

Cleveland

CLEVELAND, OHIO, January 18, 1915.

The domestic demand for turret lathes has improved but the foreign demand is lighter than for the previous few weeks. Dealers report a moderate volume of buying in small orders but no new inquiry of any size. Builders of sugar-making machinery say that the outlook is bright for a good volume of business from Cuba in the next few months. Conditions growing out of the war have made the Cuban sugar makers unusually prosperous. Makers of heavy handling, mining, and power equipment including water wheels, report conditions quiet as few large industrial projects are being launched. The demands for industrial cars and locomotives is light, although some good orders have come recently from South America. Makers report a fair demand for small malleable castings.

Cleveland, Ohio, through its commissioner of purchases and supplies, will receive bids January 28 for two electric traveling cranes, one of 25 and one of 10 tons capacity for the waterworks department. On January 27 bids will be received for stokers, bunker, ash hoppers and for two 250-hp. water tube boilers for the city hospital.

The Willard Storage Battery Company, Cleveland, will proceed at once with the erection of the second unit of its new plant on East 131st street, this work being hastened as a result of the fire which recently destroyed part of its old plant. The building will be a one story brick structure, 90 x 200 ft.

The Standard Fuel Oil Engine Co., Willoughby, O., recently incorporated with a capital stock of \$50,000, will operate under the Blanchard patents and will manufacture internal combustion engines of the Diesel type, using crude oil for fuel. For the present the engines will be built by the Ohio Clay Machinery Company, Willoughby, Ohio. L. W. Penfield, president of the latter company, is president and general manager of the engine company.

The Toledo Ford Tire Company, Findlay, Ohio, which is fitting up a factory for the manufacture of automobile tires, will install a power plant with a 300-hp. engine and a boiler capacity of 450 to 500 hp.

The Cement Block & Roofing Company, Kenton, Ohio, is contemplating an addition to its plant.

A cement plant with a capacity of 1500 bbl. per day will be erected in North Industry, Ohio. The contract for the engineering work has been placed with the Atlas Engineering Company, Cleveland, by O. C. Barber, Barberton, Ohio. A. M. Schoefeld of the Atlas Company has opened an office in the City National Bank Building, Canton, Ohio.

A new company is being formed in Sycamore, Ohio, for the manufacture of Aluminum kitchen utensils, and plans to erect a one-story building 72 x 140 ft. Paul Maliwurm, Ashland, Ohio, is one of the men backing the project.

The Fuel Saver Stove Company, Alliance, Ohio, recently organized, has elected the following officers: president, J. R. Quick; vice-president, Aaron Burkey; secretary, C. A. Notman; treasurer, C. S. Westover; and general manager, F. E. Burkey. It is making a gas stove patented by Mr. Notman.

The Frank B. Hall Company, Newton Falls, Ohio, has closed a five years' contract with Houghton & Richards, Boston, for the manufacture of power sewing machines and will probably make some extensions to its plant.

The Director of Public Service, Norwalk, Ohio, has taken bids for two rotary pumps with a capacity of 1600 gal. per min. each.

The United Chain & Manufacturing Company, Seville, Ohio, is installing additional machinery for making small chain and is putting in tool-room equipment.

The plant of the Columbia Fire Brick Company, Strasburg, Ohio, which was recently destroyed by fire with a loss of \$40,000, will be rebuilt. E. A. Bowman is the secretary.

The board of commissioners, Lucas County, Toledo, Ohio, will receive bids until 10 a.m., January 29, for light, heat and power plants.

The Central South

LOUISVILLE, KY., January 18, 1915.

Business remains quiet with machinery manufacturers and dealers. Although inquiries are fairly numerous, business actually placed is below expectations; and the return to normal conditions seems likely to be slow. The demand for heavy power equipment is improved, boiler manufacturers reporting prospects good and more jobs going through their shops than for some time. The demand is also good for small electric motors.

The Grocers' Baking Company, Louisville, has let building contracts for a \$40,000 plant. It will need motors from 3 to 10 hp. capacity and special equipment.

The Scottsville Ice & Cold Storage Company, Scottsville, Ky., is being organized with \$15,000 capital stock. It will build a plant immediately. The boiler-room and ice factory will be 51 x 60 ft. Edgar Zielian, Nashville, Tenn., is the engineer.

The Newport Culvert Company, Newport, Ky., has been incorporated with \$25,000 capital stock to manufacture open-hearth iron culverts, tanks, troughs, wagon tanks, etc. J. B. Andrews is president; J. G. Andrews, vice-president; and W. H. D. Wheat, manager.

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St. Louis

ST. LOUIS, Mo., January 18, 1915.

Conditions in the machine-tool market at this point are showing the effects of the passing of the inventory and trial balance period. Business prospects are brightening, and while the demand is not yet large and no notable lists have appeared, the total is becoming steadily more satisfactory. The aggregate is getting above the 60 per cent. of normal which has prevailed so long. Dealers are satisfied that business will now continue to improve. The flow of money in cotton sections is improving. More inquiry for machinery for new enterprises is forthcoming. Collections are getting better, money is easy and in all directions the feeling is more optimistic.

The Laclede Gas Light Company, St. Louis, is installing coal and coke handling equipment for its new 56-oven by-product plant which will have a capacity of 750 tons of coke daily.

Russell E. Gardner, president Banner Buggy Company, St. Louis, is reported as having plans for the equipment of an automobile factory.

The city of St. Louis, Mo., is receiving bids for a 20,000,000-gal. steam turbine-driven centrifugal pump for the high pressure service station. The board of public service is in charge.

The Hopkins Electric Light & Ice Company, Hopkins, Mo., will equip an ice-making plant, with compressor, operated by electric motor. G. D. Henderson is the manager.

The Pattonsburg Electric Light Company, Pattonsburg, Mo., will install an electric light plant in connection with its electric plant.

Caruthersville, Mo., will increase its sewage handling equipment, expending about \$32,000 thereon. It will also add to its waterworks equipment.

The Mays Mfg. Company, Leslie, Ark., of which J. R. Clay is president, will install equipment to manufacture hubs and staves. Ice-making and electric power and light machinery will also be installed, in addition to existing plants acquired.

The Williams & Freeman Water & Light Company, Murfreesboro, Ark., has been incorporated with a capital stock of \$10,000 to equip waterworks and electric light and power plants. J. E. Williams is president. The capital will be increased later.

Rison, Ark., will install an electric light plant at once. The mayor should be addressed.

The plants and properties of the Pemsicot Lumber Company in Arkansas have been bought by the Columbia Hardwood Lumber Company, 2048 Dominick street, Chicago, which will increase the mill equipment.

Harrison, Ark., will equip new waterworks under a bond issue and has selected Albert C. Moore, Joplin, Mo., as engineer in charge.

M. Catlett, Piggott, Ark., will equip a slack barrel and heading plant and a hickory mill at Harrisburg, Ark.

Thomas J. Turner, Marked Tree, Ark., will re-equip his handle factory, recently burned. New machinery is wanted.

The W. L. Todd Gin Company, Butler, Okla., will install an ice plant of about 10 tons capacity.

Guthrie, Okla., has voted \$50,000 for a new waterworks.

The Jackson Veneer & Box Company, Jackson, Miss., recently incorporated with a capital stock of \$10,000, will add equipment to an existing plant. F. M. Roell is president.

Birmingham

BIRMINGHAM, ALA., January 18, 1915.

While actual transactions in machinery or machine tools show no substantial increase, dealers report better collections owing to the easier movement of cotton, and inquiries that look like business as soon as additional improvement occurs. Wood-working tools are in greater demand with the slight acceleration of the lumber industry. The general tendency is to look forward with more confidence than has been justified in some time.

The Farmers Cotton Oil Company, Dothan, Ala., has been reorganized as the Planters Oil Company with a capital stock of \$100,000. G. H. Malone is president.

The Ideal Box & Grate Company, Mobile, Ala., will establish a box factory. W. B. Burton, and others, are prominent stockholders.

The Darien Mfg. Company, Darien, Ga., has been incorporated by Meyer Bluestein, Charles M. Tyson, Robert J. Downey, and others, and proposes to build an ice plant, electric lighting plant, sawmill, planing mill, etc.

The Georgia School of Technology, Atlanta, Ga., will install a power laboratory at a cost of \$200,000. K. G. Matheson is president.

E. E. Saunders & Co., Pensacola, Fla., has been incorporated with a capital stock of \$300,000 and will engage in the manufacture of ice, the fishing business, etc. Frank E. Wells is president.

The Cumberland Mountain Minerals Company, Cumberland Gap, Tenn., has been incorporated by Victor Bentner, Henry P. Spilker, Frank Montgomery, and others, with a capital stock of \$100,000. It is proposed to build a Portland cement plant with a capacity of 3000 barrels.

Texas

AUSTIN, TEXAS, January 16, 1915.

Business conditions are generally improving. With the easing of the bond market a noticeable renewal of activity in municipal public utility projects has set in, and much irrigation pumping machinery of this character will soon be required in Texas.

The Southern Oil & Gas Company, Mexia, plans to construct a natural gas pipe line to Ennis. Mark Logan is general manager.

The San Angelo Street Railway Company, San Angelo, will build a power plant. J. D. Sugg is owner.

H. S. Dew, Dewalt, and associates, plan to build a meat packing and canning plant at Brownsville to cost about \$100,000.

The county and city authorities, Paris, plan to jointly build a cold storage plant for the farmers.

The Arizona Mining & Mineral Polish Company, Tempe, Ariz., will build a plant for the manufacture of a polishing powder. W. M. Goodwin is one of the principals.

The Pacific Northwest

SEATTLE, WASH., January 12, 1915.

Machine tool business is limited to scattering orders for single tools or small groups, though merchants are preparing for a lively demand in the spring from small shops and implement houses in the interior. Notwithstanding the reopening of many mills after the holidays, every indication is that the lumber output will be greatly curtailed for months to come, and wood-working machinery is accordingly quiet. Owing to the heavy foreign demand for grain, conditions favor activity rather in the agricultural sections than along the coast; and merchants anticipate a large movement of implements, tractors, small power units, pumps, and road building equipment. Marine business also is attracting some attention, the shipbuilding plants being steadily occupied with repair work, while numerous gas engine orders are coming from the fisheries industry. Considerable machinery is now being shipped to the Alaska mines, as well as to the Orient.

W. A. Baker, Portland, Ore., has taken the Northwestern representation of the Buffalo Forge Company and has opened offices at 620 Morgan Building. He intends to open a branch office at Seattle.

The commissioner of public safety, Tacoma, Wash., is taking bids for a 24-in. x 12-ft. engine lathe.

The Oswego Lake Water, Light & Power Company, Portland, Ore., has been incorporated by A. S. Pattullo, Frederick H. Strong, and Isaac D. Hunt and will build a power plant at Oswego, Ore.

The Big Bend Machinery & Supply Company, Ritzville, Wash., has been incorporated by W. F. York, C. W. Rathbun and R. P. Clark, with a capital stock of \$10,000.

Daniel Wilder, of the Anacortes Lumber & Box Company, Anacortes, announces that he has been given contract to install and operate a double band mill at Bangkok, Siam, for the Borneo Lumber Company, London, England, equipped with ten-foot band saws, and will manufacture teak and rosewood lumber.

The plant of the Palmer Lumber & Mfg. Company, Chehalis, Wash., will be doubled in size and capacity. The company has filed new articles of incorporation, raising the capital stock to \$20,000. O. K. Palmer is president.

Plans prepared by C. A. Renshaw, city engineer, Roundup, Mont., for a \$20,000 sewer system for the city, have been accepted by the City Council. Bids will be received in February.

The Fairmount Brick & Tile Company, Eugene, Ore., will enlarge its plant, to permit of the manufacture of drain tile, terra cotta, building blocks, pressed and face brick, in addition to common brick.

It has been announced that the Crescent Chemical Company, Seattle, will erect a factory in Walla Walla for the manufacture of fruit tree sprays. H. Macshmedt is president.

The Beaver State Motor Company, Gresham, Ore., is installing equipment, including a milling and boring machine. The improvements will cost about \$25,000.

The Clift Motor Company, Bellingham, will build a new gas engine and ship chandlery plant on the waterfront in Bellingham. C. X. Folsom, president of the company, states that work will begin not later than March 1 and will be rushed to completion. It will be built on a much larger scale than the present plant and some machinery will be required.

Billings, Mont., has sold \$450,000 of water bonds. It will take over the plant about February 1 and will let contracts shortly after that date for improvements.

The power plant in Enumclaw, Wash., has been taken over by the Puget Sound Traction, Light & Power Company, Seattle, which will reconstruct and install new machinery.

The plant of the Izett Lumber Company, Brinnon, Wash., has been sold to a syndicate of Seattle business men for \$125,000.

Eastern Canada

TORONTO, ONT., January 16, 1914.

Davis & Co., Kingston, Ont., will erect a tannery at a cost of \$80,000 to replace one recently destroyed by fire. New machinery will be purchased.

The Canadian Northern Ontario Railway roundhouse at Hartes' Corners, Trenton, Ont., was destroyed by fire with a loss of \$100,000.

A \$5000 addition will be built to the electric power house at Brockville, Ont. All new machinery will be purchased by H. Phillips, the manager.

Construction work will be started as soon as possible on an electric power plant at Dundalk, Ont. W. W. Ridley is town clerk.

A three-story brick factory will be erected at Brantford, Ont., for the Brantford Scale Company to cost \$20,000. No contracts have so far been let. J. L. Howard, 22 Dalhousie street, is manager.

The St. Lawrence Tanning Company, 61 St. Gabriel street Montreal, will erect a factory at Contrecoeur, Que., in the spring. Machinery and equipment for a two-story factory and warehouse will be required.

The ratepayers of Parkhill, Ont., passed a by-law to grant \$3000 for extensions to the waterworks plant.

The ratepayers of Dunnville, Ont., passed a by-law to grant \$12,000 for the construction of a waterworks plant.

The ratepayers of Alexandria, Ont., passed a by-law to grant \$5000 to make additions and improvements to the waterworks and electric light plants.

The ratepayers of Hespeler, Ont., passed a by-law to grant \$35,000 for the construction of a stand pipe and reservoir and to install new pumping machinery in its waterworks plant.

The Automatic Box Company, recently incorporated, will establish a factory at Toronto.

The Ingersoll Machine Company, Ltd., Ingersoll, Ont., has been incorporated with a capital stock of \$40,000 by Louis A. David, L. E. A. D. Mailhot, S. H. R. Bush, Edward C. Baker, and others, of Montreal, to manufacture machinery, ammunition, equipment and electrical and mechanical devices, etc.

The H. & H. Box Company, Ltd., Pembroke, Ont., has been incorporated with a capital stock of \$100,000 by Arthur J. Thomson and William S. Morlock, 85-93 Bay street, Toronto, Richard C. Berkinshaw, and others, of Toronto to manufacture boxes, furniture, lumber, etc.

The Dominion Engine Supplies Company, Ltd., St. Georges, East Beauce, Que., has been incorporated with a capital stock of \$20,000 to manufacture engines, supplies, etc.

The Booth Felt Company, Gananoque, Ont., will make extensions to its factory. E. M. Booth is manager.

It is reported that the International Harvester Company's plant at Chatham, Ont., is to be sold to the Massey-Harris Company.

The William Wrigley Company will make a two-story addition to its factory on Carlaw avenue, Toronto to cost \$65,000.

Gingras and David's sash and door factory at Bordeaux, Que., near Montreal, was totally destroyed by fire with a loss of \$50,000.

A planing and lumber mill will be established at the North-West Arm, Halifax, N. S. Charles T. T. Piercy and W. D. Cranston are back of the enterprise.

The ratepayers of Chatham, Ont., passed a by-law to grant financial assistance to the Everlasting Casket and Vault Company, which will erect a plant there to manufacture iron and steel vaults, etc.

George Minorgan & Sons, Beaverton, Ont., will make additions to its factory to cost \$6000.

Fire did \$8000 damage to the Hillsboro Woodworking Company's factory, the Albert Railway Company's shop and the grist mill at Moncton, N. B.

The Munro Construction Company, Ltd., Montreal, has been incorporated with a capital stock of \$50,000 by T. J. Coulter, W. S. Jones, Robert T. Mullin, and others, to manufacture cement, brick, etc.

The Gulf Pulp & Lumber Company, Ltd., Montreal, has been incorporated with a capital stock of \$250,000 by Shirley P. Kananagh, V. R. Lamontagne, F. W. Harper, and others, to manufacture pulp wood, paper, etc.

G. M. Gest, Ltd., Montreal, has been incorporated with a capital stock of \$100,000 by Walter R. L. Shanks, Francis G. Bush, George R. Drennan, and others, to manufacture metals and electrical goods and other appliances, etc.

Western Canada

WINNIPEG, MAN., January 11, 1915.

The Western Electrical Company, Ltd., Regina, Sask., has been incorporated with a capital stock of \$20,000 to manufacture electrical goods, etc.

The Laminated Materials Company, Boston, Mass., will establish a plant for the manufacture of veneered cases, etc., at New Westminster, B. C.

The Canadian Threshing Machine Company, Moose Jaw, Sask., whose capital stock is \$1,000,000, proposes to erect a plant. W. E. White is one of the principals in the company.

Large additions will be made to the Ogilvie Flour Mill, Fort William, Ont., and a 750,000 bu. extension will be made to the elevator. G. A. Coslett is local manager.

Government Purchases

WASHINGTON, D. C., January 18, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, February 2, schedule 7822, one 14-in. x 7-ft. engine lathe and one milling machine, both for Boston; until February 9, schedule 7825, one turbine pump for Annapolis; schedule 7826, one milling machine for Washington, D. C.; schedule 7827, one plate planing machine and schedule 7841, one toggle press, both for Norfolk.

Trade Publications

Multiport Valves.—Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. Booklet. Size, 6 x 9 in.; pages, 72. Describes a line of multiport valves for back pressure, relief and vacuum service, flow service in connection with mixed-flow turbines and check valve service with bleeder or extraction turbines. The essential idea of the multiport valve is the number of small disks instead of a single large one, to secure greater safety, quietness, lightness of moving parts and tightness. This principle is employed with certain modifications in all the different types of valves. The text of the pamphlet is supplemented by numerous engravings of the various styles of valves, as well as tables of dimensions. Numerous diagrams of layouts together with data on the effects of air in condensers and upon turbine performance are included.

Screw Cutting Engine Lathe.—W. F. & John Barnes Company, Rockford, Ill. Circular. Describes briefly a 16-18-in. screw cutting engine lathe for use in repair shops and manufacturing plants. A condensed specification table of the lathe, which was illustrated in *The Iron Age*, September 3, 1914, is included.

Electric Motors.—Reynolds Electric Company, 422 South Talman avenue, Chicago, Ill. Bulletin No. 201. Illustrations and descriptive matter explain the construction of a line of fractional horsepower sizes of alternating-current motors. Among the special advantages claimed for the motors are large overload capacity and starting torque and the maintenance of a continuous speed. Dimension and specification tables are used to supplement the text description.

Watt-hour Meters.—Sangamo Electric Company, Springfield, Ill. Bulletin No. 40. Illustrates and describes a line of alternating-current watt-hour meters for use on single and polyphase circuits. The construction of the meters is gone into at some length, the text being supplemented by numerous engravings of the various parts. Special emphasis is laid upon the adjustments for full, light and inductive loads, with

instructions on how to make them. Tables of the various meters that can be furnished are included, together with connection diagrams.

Metal Band Sawing Machine.—H. C. Williamson, 1840 West Lake street, Chicago, Ill. Circular. Describes a metal band sawing machine that can be used for cutting off practically any length of stock. Illustrations of the machine, equipped for both belt and motor drive are used to supplement the description and a condensed table of specifications is included. An illustrated description of this machine appeared in *The Iron Age*, September 3, 1914.

Screw Machines.—H. P. Townsend Mfg. Company, Hartford, Conn. Pamphlet. Devoted to a line of automatic hopper feed screw machines which are designed for making rivets, screw blanks and any cold headed or upset articles of a similar nature. The various machines, which include one for shaving and slotting and another for pointing and threading, are illustrated and described, and data on the dimensions and production of these machines are included. Mention is made of special machines that can be supplied, using the standard unit as a foundation, and a drawing showing the different operations that can be performed on a single blank as well as a variety of special pieces that have been turned out by the machines is included. An illustrated description of this line of machinery appeared in *The Iron Age*, October 1, 1914.

Wire Rope.—Waterbury Company, 80 South street, New York City. Pamphlet. Contains illustrations and brief descriptions of a line of wire rope in which each strand is served with marine. The advantages claimed for this arrangement are the prevention of chafing and wear of the strands, the elimination of rusting and the prevention of foreign matter from working through to the wire strands of the rope. This rope is used for hoisting and transmission work, and a number of tables of the various sizes in which both classes of rope can be supplied are included.

Fuel Oil.—Production Engineering Company, 1716 Spring Garden street, Philadelphia, Pa. Pamphlet O and leaflet. The first contains some facts about fuel oil for use in open-hearth and heat treating furnaces, core ovens and mold dryers, power plants, etc. An illustration of the burner of the company which can be operated with any oil pressure from 0 to 120 lb. and under compressed air or steam pressure, ranging from 30 to 120 lb., with a consumption of from 2 to 70 gal. per hr. is presented, together with a table of the average heating values per pound of commercial fuel. The circular deals with the applications of fuel oils, and contains a brief historical review of the development of their use. A description of the burner is included, together with diagrams showing the influence of the excess of air on furnace temperatures and the maximum cost of oil in cents per gallon and equal economy with coals of different heat values and prices.

Stop Valves.—Nelson Valve Company, Chestnut Hill, Philadelphia, Pa. Mailing card. Treats of the use of non-return valves on boilers and calls attention to the advantages of the company's cushioned non-return stop valves, which are designed to prevent hammering or chattering and operate automatically. An illustration of the valve showing its interior construction is presented, and special emphasis is laid upon the fact that the piston cannot stick in the dash-pot and that wire drawing is prevented.

Mechanical Respirator.—Life Saving Devices Company, 1099 Times Building, New York City. Mailing card. Shows the Lungmotor, which is a mechanical respirator operated by hand. The special features claimed for this device are that it works simply by hand, without tanks, wires, etc., and that the amount of air that can be supplied may be varied according to the age of the person being treated. An illustration of the device in use is relied upon to tell the story, there being practically no text description of the device.

Steam-Hydraulic Presses.—Mesta Machine Company, Pittsburgh, Pa. Bulletin L. Describes and illustrates a line of steam-hydraulic presses for shearing, bending, forging, flanging, punching, etc. The special features of the press, which is equipped with a single lever control, are rapidity of production, self-contained construction, practically continuous service, etc. All of these are briefly touched upon and a number of views of the presses performing various operations are included. The presses are built with either single frames having capacities from 200 to 400 tons, or in a four-column type with capacities ranging from 500 to 12,000 tons. A diagram showing the extent of saving in power which may be effected in pressing steel at high temperature is included.

Metal Sheets and Roofing.—Portsmouth Steel Company, Portsmouth, Ohio. Catalogue. This is the company's 1915 catalogue, listing and illustrating a line of black and galvanized sheets, galvanized roofing, ridge roll, conductor pipe, eaves trough and fittings. Tables of the number of sheets

of different sizes and gauges that are contained in a bundle are given, together with a list of the extras for widths and lengths and tables of the standard gauges for sheet and plate iron and black sheets. Illustrations of the different formed products are presented with lists of the sizes in which they can be supplied.

Portable Machine Tools.—Pedrick Tool & Machine Company, 3638 North Lawrence street, Philadelphia, Pa. Catalogue. Illustrates a line of portable machine tools for railroad and general machine shops and shipyards. The tools covered include cylinder and Corliss valve seat boring bars; turning, milling, and pipe bending machines; a forcing press, a piston ring grinding machine and a portable valve seat rotary planing machine. The engravings of all of these machines are supplemented by brief descriptions and condensed specification tables. Illustrated descriptions of a motor-driven milling machine and a hand machine for bending large pipe appeared in *The Iron Age*, February 26 and August 20, 1914, respectively.

Reinforced-Concrete Construction.—Turner Construction Company, 11 Broadway, New York City. Bulletin No. 14. Calls attention to the service which this company is prepared to render to owners in the erection of industrial reinforced-concrete buildings. The different forms of contracts are briefly touched upon, followed by a discussion of the various factors entering into efficient construction such as equipment, labor, office organization, etc. Throughout the bulletin are views of buildings erected by this company which range all the way from a small stable 50 x 88 ft. to a 12-story industrial building measuring 125 x 200 ft., the highest concrete building in the world.

Electric Fans.—Emerson Electric Mfg. Company, 2024 Washington avenue, St. Louis, Mo. Catalogue No. 6700. Refers to a line of fans for alternating and direct current circuits. The fans illustrated include the customary styles for use on desks, brackets and columns in both the fixed and oscillating types, exhaust fans and ceiling and column fans with electric lights. In addition to these a new 9-in. oscillating fan, new types of 12-in. desk and oscillating fans with six blades and a small sweep six-blade ceiling fan are listed. The construction of all of the different types of fans is gone into at some length with tables of the sizes in which they can be supplied.

Twist Drills.—New Process Twist Drill Company, Taunton, Mass. Catalogue. Size, 6 x 9 in.; pages, 65. Lists a line of carbon and high-speed steel twist drills that are made by the hot forged process. The various steps in the process from the blanks to the finished drill are shown and this is followed by illustrations of the different drills with tables of the sizes in which they can be furnished. Mention is also made of mounted sets and revolving drill stands and a number of tables of useful information are included.

Anodes and Plating Salts.—Munning-Loeb Company, Matawan, N. J. Bulletin No. 600. Presents brief illustrated descriptions of a line of anodes and plating salts, and contains information on anode characteristics, efficiencies and effects of shape of special interest to platers and all users of anodes. There are numerous illustrations in the bulletin, including some interesting ones showing the various stages of anode decomposition. The anodes are made in two-bar, flat and curved shapes of copper, brass, bronze, zinc, tin, silver and gold, and in addition mention is made of the special anodes that can be supplied, as well as nickel in the form of castings, rolled sheets, shot, wire and rods. A discussion of single and double nickel salts is included.

Reinforced Spiral Pipe.—Standard Spiral Pipe Works, First National Bank Building, Chicago, Ill. Catalogue. Points out the advantages of using reinforced spiral pipe for water supply lines, suction and blow piping, exhaust steam, compressed air, ventilation or vacuum cleaning systems and dust or shavings collecting systems. A brief description of the manufacture of the pipe supplemented by a number of engravings of various stages is presented followed by a list of the different sizes and styles of pipe that can be furnished. Mention is also made of the forged steel flanges, valves, cast fittings and specialties used in connection with the pipe, illustrations and lists of the different sizes of the various fittings being included.

Single-Acting Pillar Press.—Waterbury Farrel Foundry and Machine Company, Waterbury, Conn. Circular No. 463-N. Gives general description and specifications for a single-acting pillar press with ratchet and friction dial feeds that was illustrated in *The Iron Age*, October 1, 1914. After a general description of the construction of the presses the attachments that can be supplied are described at some length. Engravings of the press equipped with both the ratchet dial and the friction dial feed are included.



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